

# IDENTIFICATION AND CLASSIFICATION OF ADAPTED EQUIPMENT IN OUTDOOR GYMS: A STUDY IN FOUR CITIES

## *IDENTIFICAÇÃO E CLASSIFICAÇÃO DE EQUIPAMENTOS ADAPTADOS EM ACADEMIAS AO AR LIVRE: ESTUDO EM QUATRO CIDADES*

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### Resumo

As academias ao ar livre se constituem em um espaço democrático para promover a saúde e inclusão social de seus usuários. Assim, as atividades motoras podem ser estendidas a pessoas com deficiência. A pergunta que norteia esse estudo é: essas academias possuem equipamentos adaptados para a realização de atividades motoras por parte de pessoas com deficiência? Portanto, o objetivo foi identificar e classificar os equipamentos presentes em academias ao ar livre em quatro cidades. Enquadra-se como um estudo exploratório, descritivo, com análise qualitativa e quantitativa. Para iniciar a coleta, foram visitadas Academias ao Ar livre em quatro cidades, em três estados diferentes e todos os equipamentos disponíveis foram fotografados para posterior análise. Paralelamente, foi realizada uma busca na internet para descobrir as empresas que comercializam esses equipamentos e para identificar qual deles tinham o selo para uso por pessoas com deficiência. Os resultados indicaram a existência de 28 equipamentos destinados a usuários de cadeiras de rodas. As variáveis escolhidas para a coleta foram: 1) acesso às academias; 2) equipamentos presentes; 3) equipamentos destinados a pessoas com deficiência; 4) estado de conservação do equipamento; 5) instruções escritas para uso dos equipamentos. A coleta ocorreu em 29 academias ao ar livre e foram analisados 198 equipamentos, sendo possível mensurar, de forma adequada, as variáveis cotizadas. Os resultados das aplicações indicaram necessidade de manutenção de acessos e equipamentos e, principalmente, a instalação de placas indicando como a população deve utilizá-los.

**Palavras-chaves:** Atividade Motora Adaptada. Equipamentos de Ginástica. Atividades ao Ar livre. Avaliação.

### Abstract

Outdoor gyms are a democratic space to promote the health and social inclusion of their users. Thus, motor activities can be extended to people with disabilities. The question that guided this study is: do these gyms have equipment adapted for people with disabilities to perform motor activities? Therefore, the objective was to identify and classify the equipment present in outdoor gyms in four cities in Brazil. The study is an exploratory, descriptive study with qualitative and quantitative analyses. First, outdoor

gyms were visited in four cities in three different states in Brazil to initiate data collection, and all available equipment was photographed for later analysis. At the same time, an internet search was conducted to find the companies which sell this equipment and to identify which of them had received the certification seal for use by people with disabilities. The results indicated the existence of 28 kinds of equipment intended for wheelchair users. The variables chosen for collection were: 1) access to the gyms; 2) equipment present; 3) equipment intended for people with disabilities; 4) the equipment condition; and 5) written instructions for using the equipment. The data collection took place in 29 outdoor gyms and 198 pieces of exercise equipment were analyzed, thereby enabling to adequately measure the evaluated variables. The results of the applications indicated a need for maintenance of access points and equipment, and mainly to install signs indicating how the population should use them.

**Keywords:** Adapted Motor Activity. Gym Equipment. Outdoor Activities. Assessment.

## 1 Introduction

Outdoor gyms, also known as open-air gyms or senior gyms, were given institutional space by the Health Gym Program proposed by the Federal Government in 2011 (Brasil, 2020). They are intended for public spaces where physical and physical activities are performed, but with the possibility of incorporating cultural actions from Brazilian communities with their diversity, specificities and local habits. According to the National Health Plan 2020-2023, there were 4,188 current proposals as of 2019, of which 2,690 had been completed, 574 were under construction and three were being adapted (Brasil, 2020). Therefore, this is a historical reality which is already part of Brazilian culture. A study by Agrizzi *et al.* (2023) in a Brazilian state capital city indicated that outdoor gyms, among other spaces for physical activities, offer greater possibilities for varying activities, and are more present in squares; therefore, they constitute democratic public spaces.

Outdoor gyms enable performing health-related activities in addition to promoting integration among people in the community. It is a space for physical activity, but it is also a cultural space, which can generate integration and social inclusion (Minas Gerais, 2017).

Studies on outdoor gyms have focused on several factors, such as public policies for these spaces (Abade; Pereira, 2021), the reasons users indicate for attending them (Mathias *et al.*, 2019), and the occurrence of injuries (Silva *et al.*, 2016).

The focus on public policies for these spaces is discussed by Abade and Pereira (2021). The authors describe the policies aimed at sports and leisure in great detail in the city of Belo Horizonte, which had an Open-Air Gym Program. Based on documents and an interview with a manager responsible for actions within this Program, the conclusions demonstrated obstacles related to the maintenance of these spaces, with private partnerships; the distribution of gyms throughout the city; an unclear policy on which sectors could be responsible for and linked to Open-Air Gyms; and also the lack of professionals to guide and monitor users.

Mathias *et al.* (2019) studied the reasons that lead people to seek out an outdoor gym (among other aspects). The study was conducted at the Aeroparque de Paranaguá, PR, Brazil, and 64 gym users were interviewed using the Inventory of Motivation for Regular Practice of Physical and Sports Activity. The results indicated that the main reason described by the participants, on a total scale of 100 points, was pleasure (83 points), followed by issues related to health (79.8 points), aesthetics (67.7 points), stress control (64 points), sociability (54.5 points) and competitiveness (50.6 points).

The occurrence of injuries during physical activity in outdoor gyms was studied by Silva *et al.* (2016). The authors conducted the study in Curitiba, in the state of Paraná, and interviewed 411 users of these spaces. They concluded that the number of injuries is low and that the use of equipment during exercise seems safe, but the authors do not rule out the need for guidance on ways to prevent injuries.

These public spaces are essential for democratizing practice of physical activities which can bring health benefits at a low cost to users. However, some research on this topic has pointed out some needs: 1) equipment maintenance; 2) adequate knowledge on the part of users about its use; 3) the need for supervision by a competent professional of the activities performed in order to produce better engagement (Costa; Freitas; Silva, 2016; Minas Gerais, 2017).

Preserving and maintaining outdoor gym equipment is a necessity which must be planned from the moment it is installed. The equipment is estimated to last for 5 years, and one way to maintain it is through public-private partnerships, but it is also possible that the resources may come from parliamentary amendments (Minas Gerais, 2017). There are questions regarding private partnerships about delegating maintenance care to private companies, which may reveal a certain weakness in public management and also in its financing (Abade; Pereira, 2021).

One of the problems with outdoor gyms may refer to the inappropriate use of equipment, because, despite seeming intuitive, the equipment is varied and has specific functions in terms of motor activities. Incorrect use, whether in terms of time or way of positioning the body, can lead to discomfort, as pointed out in a study by Costa, Freire and Silva (2016). When interviewing users of these gyms, the authors identified that: the users did not know how to use the equipment (31.3%); they reported discomfort due to use (16%), despite having described that they were instructed during the practice of motor activities (23%). In a general assessment, the majority indicated the need for instructions on the use of the equipment and its exercises (69%). This same question is presented by Abade and Pereira (2021), as it is understood that public policies for this sector do not provide professionals who are trained to serve as instructors and monitor the use of this space and equipment in order for there to be a successful path.

However, when it comes to research on gyms that focus on people with disabilities, what has been produced in terms of knowledge?

## 2 Adapted equipment in outdoor gyms

Knowledge production in Brazil about outdoor gyms with a focus on people with disabilities is still lacking. When this search is conducted, what is found are articles and studies that deal with issues related to indoor gyms and open spaces which mainly raise questions about the topic of accessibility. (Lima, 2018; Manta; Palma, 2011; Martins, 2012; Razuck *et al.*, 2021).

Lima *et al.* (2018) investigated the issue of accessibility in gyms in Barra da Tijuca in the West Zone of the city of Rio de Janeiro, Brazil. The study was observational and *in loco*. According to the authors:

The results show that 60% of the gyms observed have access ramps, 53% have adapted bathrooms, 40% have automatic doors and elevators with Braille panels, 67% have an accessible route, while none of them have adequate floors, accessible counters or web accessibility (Lima *et al.*, 2018, p. 49).

A study along the same lines was conducted by Razuck *et al.* (2021), which aimed to analyze the accessibility level for wheelchair users in gyms in the South Zone of the city of Rio de Janeiro. The instrument used was the Vidor Scale, applied through interviews with gym employees. The scale offers a score to classify gyms into five levels: Diamond, Gold, Silver, Bronze or No Certification. The instrument was used in 20 gyms and the results indicated that only one gym presented the bronze standard and 19 were scored as “No Certification”.

The subject of accessibility is also studied in public squares and parks, as it is an important point, including for entering the space of Outdoor Gyms. Manta and Palma (2011) interviewed seven people with physical disabilities and the interviews were conducted in the space of public parks. The reports from the study participants indicated: 1) problems with physical barriers, such as holes, uneven surfaces, steps, lack of ramps, accumulation of dirt and sand on the paths, and types of surfacing which could damage wheelchairs; 2) poor maintenance of equipment, such as rust and other broken equipment; 3) lack of equipment for physical activities for wheelchair users. The participants indicated that nets were needed to separate the spaces in order to improve the structure of the park, especially for those who used balls.

People with disabilities expressing their opinions on the conditions provided in terms of accessibility and other conditions is necessary and relevant, as shown in the study by Manta and Palma (2011). Martins' (2012) approach also aimed to listen to

people with physical disabilities and visual impairments through a focus group. The focus group was composed of 14 people, six with physical disabilities who participated in a wheelchair handball project and eight blind people, participants in a goalball project. The results for both groups of participants indicated issues related to: 1) the need for good quality in the gym's surroundings and building; 2) the equipment layout; 4) the adequacy of bathrooms and changing rooms; and 5) the perspectives on administrators and physical education professionals.

When studying the public documents that govern the operation of Outdoor Gyms, it is noted that they do not always provide information on how to “[...] contemplate the use of specific equipment for children and people with disabilities” (Minas Gerais, 2017, p. 6).

In this sense, the questions which guided this study were: Is there space in Outdoor Gyms for motor activities adapted for people with disabilities? What equipment is present? How well maintained is it? Are there instructions on how to use this equipment? Thus, the objective is to identify and classify the equipment present in Outdoor Gyms in four cities in Brazil.

### 3 Method

This study can be classified as an exploratory study (Sampieri; Collado; Lucio, 2014) with qualitative and quantitative treatment and analysis (Manzini, 2024).

According to Sampieri, Collado and Lucio (2014), an exploratory study aims to identify areas, environments, and contexts in order to determine the relationships between the variables. In this sense, there was no material available in the literature to choose the variables for the study in question. It was therefore necessary to visit several Outdoor Gyms to explore these environments and firstly collect the data.

Thus, we visited outdoor gyms located in four cities to begin the exploratory study; two in the state of São Paulo, one in the state of Paraná, and one in the state of Rio Grande do Norte. The premise was that these geographic choices would make it possible to find different kinds of equipment in the outdoor gyms. Data collection began with the visits and photographic records of all the equipment present. We also investigated the access to the equipment in these locations, meaning whether there was architectural accessibility to get to the square where the equipment was located. We checked whether there were signs indicating how to do the exercises and whether there was any sign indicating the installation date of the outdoor gym. Care was taken when recording the equipment to ensure photographing it when there were no users on it. Whenever possible, the photos were taken when there was no sun so as not to cast shadows on the equipment.

After visiting five squares, the exploratory process began by identifying and classifying the equipment according to the names given by the suppliers. To this end, an internet search was simultaneously conducted to identify the suppliers and to register the products available in the catalogs with their respective names. The equipment which could be intended for people with disabilities (according to the suppliers) was also classified.

The next phase was to identify the possible variables for analysis, and six variables were identified: 1) name of the equipment; 2) presence; 3) existence of the certification seal indicating that it is adapted equipment; 4) condition (new or semi-new, in need of minor maintenance, in need of maintenance, or broken); 5) existence of instructions for use: general, specific and to cover all the equipment in the gym. These variables were based on the literature and presented in the initial part of this text, and also during the initial data collection by observing the equipment and photos.

Data collection continued at other Outdoor Gyms, and whenever new kinds of equipment/machines was not present in the previous collection, it was photographed and inserted to continue collection in other environments. All collection was photographed for later analysis. An Excel spreadsheet was created to record the data.

## **4 Results**

The results from the equipment identified by suppliers intended for people with disabilities is initially presented in this section, and then the results regarding the conditions that were measured in the collection.

### **4.1 Equipment identified and marketed for outdoor gyms**

Companies which sold equipment for outdoor gyms were identified through an extensive search on Google (Brazil), using the following expressions: “outdoor gym equipment”; “purchase of outdoor gym equipment”; “gym equipment for people with disabilities”. After this search, sites that referred to blogs or other content were excluded, and the focus was on companies that presented a catalog for sale. In turn, three suppliers were identified using these criteria, which will be indicated by letters (A, B, C).

The collection consisted of selecting all the equipment by their names, and creating a list. The companies presented technical diagrams of the equipment in all the catalogs. These diagrams were essential for naming each kind of gym equipment which was being photographed in the first five gyms visited. Therefore, the squares were visited even before the complete list was prepared, since the on-site work took

longer due to the need to travel through the neighborhoods of the four cities.

When analyzing the equipment in the catalogs, it was possible to see that there is a variation in relation to the number of users that can use a piece of equipment, whether it is single, double or triple. The example below shows an exercise machine which can be used by two people at the same time.

Figure 1 – Double elliptical exercise machine.



Source: The author.

Description: The machine is painted dark blue on the part that supports the bars that move it. The movement mechanism is painted yellow. You can see support for the right and left feet at the bottom. A vertical bar at the top shaped like a bicycle handlebar allows the user to hold and perform the movements of pushing the bars forward and backward, which also causes the feet to move alternately, forward and backward, as if they were sliding.

A double elliptical exercise machine can be seen in Figure 1, assessed as new, a fact which was proven from informal reports from users, indicating that the machine had been replaced two months ago.

When analyzing the names of the exercise equipment presented by the suppliers, it was found that most of the equipment has practically the same name, with some exceptions with different registration, for example, the “pull-up bar” also received the name “development”. The comparison was possible by identifying the designs in the catalogs.

A second analysis found that there was a variation in the number of equipment pieces/machines in the suppliers’ catalogs, as shown in Table 1.

Table 1 - Number of exercise equipment pieces/machines provided by suppliers.

Supplier	Total number of exercise equipment pieces	Suitable for people with disabilities
A	76	16
B	52	15
C	85	24

Source: The author.

The third analysis was to compare the equipment/machines among the suppliers to determine whether they were the same or different. It was found that there were 28 different pieces of equipment intended for people with disabilities. It was clear in the indications that wheelchair users seem to be the target population of the equipment. The equipment found in the catalogs were: 1) Abdominal machine; 2) Bench press machine (model 1); 3) Bench press machine (model 2); 4) Biceps machine; 5) Triceps machine; 6) Rowing machine; 7) High pull-down machine; 8) Set of parallel bars; 9) Set of bars; 10) Set of fixed bars 3 heights; 11) Wrist twist; 12) High rotating bar; 13) Hand pedal; 14) Bench press without wheelchair base; 15) Double vertical twist; 16) Diagonal twist; 17) Vertical twist; 18) Multi-twists; 19) Pectoral fly; 20) Rowing; 21) Single pull-up; 22) Double pull-up; 23) Stationary rings; 24) Vertical bar; 25) Diagonal bar; 26) Individual wheelchair swing; 27) Wheelchair swing; 28) Carousel or merry-go-round for wheelchair.

#### 4.2 Results related to the measured variables

Data collection was performed in four cities and Table 1 indicates the number of outdoor gyms from which data was collected.

Table 2 - Number of outdoor gyms in the cities targeted by the study.

City	Number of outdoor gyms analyzed in each city
A	14
B	3
C	5
D	7
<b>Total</b>	<b>29</b>




Source: The author.


The parameters related to equipment maintenance were observed using the following criteria: 1) new or semi-new equipment that showed no signs of wear, such as friction on the seats and footrests; 2) equipment requiring minor maintenance indicated by small spots of rust and wear due to use; 3) equipment requiring maintenance



indicated by several spots of rust and mainly wear on the paint due to use and the fact that it was outdoors and subject to weather conditions; and finally, 4) broken equipment. These parameters are presented in the photos in the table below.

Figure 2 - Examples regarding equipment maintenance.

Exercise equipment/machine photo	Equipment maintenance	Figure description
 <p data-bbox="171 809 467 839">Walking treadmill simulator</p>	<p data-bbox="628 624 814 654">New or semi-new</p>	<p data-bbox="857 464 1193 814">The equipment is painted dark blue on the structure which supports the bars that move it. You can see a support for the right and left feet in yellow at the bottom. There is a fixed horizontal bar at the top, which allows the user to hold on. The lower part is mobile and allows you to perform alternating movements with your feet, forward and backward, as if you were taking a step.</p>
 <p data-bbox="171 1222 467 1252">Walking treadmill simulator</p>	<p data-bbox="628 1049 838 1079">Minor maintenance</p>	<p data-bbox="857 997 1179 1130">This is the same equipment, only the yellow color has been replaced by orange. There is some wear on the foot support part.</p>
 <p data-bbox="171 1658 467 1688">Walking treadmill simulator</p>	<p data-bbox="628 1462 765 1519">In need of maintenance</p>	<p data-bbox="857 1424 1177 1557">This is the same equipment, only the yellow color has been replaced by orange. The equipment has rust marks and the colors are faded.</p>

	Broken	There is no equipment, only a blue bar can be seen, vertically, embedded in the concrete floor, indicating that there was equipment on site.
No identification		

Source: The author.

It was then possible to perform a tabulation in relation to the equipment maintenance using the criteria displayed in Table 3.

Table 3 – Exercise equipment/machine maintenance.

City	New or semi-new	Minor maintenance	Maintenance needed	Broken	Total
A	12	23	26	9	<b>70</b>
B	28	-	-	-	<b>28</b>
C	49	1		1	<b>51</b>
D	45	4			<b>49</b>
<b>Total</b>	<b>134</b>	<b>28</b>	<b>26</b>	<b>10</b>	<b>198</b>

Source: The author.

Information boards in Outdoor Gyms could be present or not and could contain three types of instructions: 1) no instructions; 2) general instructions, mainly for stretching; 3) specific instructions for the equipment, as there was equipment whose boards did not inform how to use it.



Table 4 – Informative signs.

City	No signs	General instructions	Specific instructions	Total
A	12	1	1	14
B		1	2	3
C	3	1	1	5
D	7			7
<b>Total</b>	<b>22</b>	<b>3</b>	<b>4</b>	<b>29</b>

Source: The author

The criteria established for access to the equipment were: 1) poor access, when there were stairs or steps in the square to reach the equipment or when the ramp needed maintenance, with dirt and holes; 2) good access when the ramps and paths allowed passage of pedestrians and wheelchairs.

Figure 3 – Quality of access to outdoor gyms.

	Photos	Photo description
Poor access		It has a ramp that goes from the street to the sidewalk, but with holes at the beginning of the ramp. The floor of the ramp is painted blue, but faded.
Good access		It has a walkway, with a slight slope, to the equipment location. A new gray paint job was done, and on the sides there is a painting with yellow stripes.

Source: The author.

When analyzing access to Outdoor Gyms in the four cities, it was found that there is a need to plan access to these public spaces and also the need to maintain access ramps. The following table presents the data collected on this variable.

Table 5 – Access to the outdoor gyms.

City	Good	Poor	Total
A	1	13	14
B	3	-	3
C	4	1	5
D	7	-	7
<b>Total</b>	<b>15</b>	<b>14</b>	<b>29</b>

Source: The author.

One of the variables measured was the existence of equipment for people with disabilities. Equipment for wheelchair users was found. The table below presents the data collected on this variable.

Table 6 – Total number of exercise machines analyzed and number allocated to users with disabilities.

City	Total number of analyzed exercise machines	Number for people with disabilities
A	70	11
B	28	1
C	51	2
D	49	2
<b>Total</b>	<b>198</b>	<b>16</b>

Source: The author.

An important issue concerns identification of the 16 pieces of equipment and intended for people with disabilities. Table 7 indicates which and how many pieces of equipment there are.

Table 7 – Number of identified exercise machines/kinds of equipment intended for users with disabilities.

Identified outdoor gym exercise equipment	n
Abdominal machine	1
Bench press machine (model 1)	2
Bench press machine with retractable bench (model 2)	1
Biceps machine	1
Triceps machine	1
Rowing machine	-
Lockdown machine	-
Set of parallel bars	-
Set of bars	-
Set of fixed bars 3 heights	1
Wrist twist	-
High rotating bar	-
Hand pedal	-
Bench press without wheelchair base	1
Double vertical twist	-
Diagonal twist	-
Vertical twist	2
Multi-twists	-

Pectoral fly	-
Rowing	-
Single pull-up	2
Double pull-up	-
Stationary rings	-
Vertical bar	-
Diagonal bar	1
Individual wheelchair swing	1
Double Wheelchair swing	1
Carousel or merry-go-round for Wheelchair	1
<b>Total</b>	<b>16</b>

Source: The author.

## 5 Discussion

When analyzing access to gyms, it was found that 15 (52.7%) had access considered good, however access was considered poor in 15 of them (48.3%). In this sense, there seems to be a need for city governments to also take care of the maintenance of accesses, since these gyms are frequented by children, older adults, and the general population. Studies have shown that danger points are the first precautions to be observed when the topic is accessibility in public spaces (Corrêa; Manzini, 2012), since the very definition of accessibility indicates that it is about the use of spaces with autonomy and safety (Brasil, 2015). Some authors cited at the beginning of this article also found similar data, such as: holes, problems with unevenness, presence of steps, lack of ramps, and dirt such as earth and sand on the paths of public parks (Manta; Palma, 2011; Martins, 2012).

Regarding the total number of exercise equipment pieces analyzed (198), it was found that around 8% of them are intended for people with disabilities. However, if the focus of the analysis unit is the City, it is found that Cities B, C and D have a percentage of 3% to 4% of equipment intended for wheelchair users, while there is 15.7% of this type of equipment in City A. Paradoxically, City A has the worst access to the outdoor gyms, with access being poor in 13 of the 14 squares. There is a specific square in this city where equipment intended for wheelchair users has been installed. One discussion that can be presented is related to the reduced number of participants with disabilities when proportionally compared to the other attendees who use sports equipment (Dornellas, 2021). However, the basic premise is that public policy must serve all citizens, and creating conditions for access and accessibility to public places is a right which is already guaranteed in several Brazilian laws.

Another variable analyzed was equipment maintenance. The data collected indicated that of the 198 pieces of equipment analyzed, 70 (67%) were considered new or semi-new, 28 (14%) needed minor maintenance, 26 (13%) needed maintenance, and 10 (5%) were broken. However, 9 of the 10 pieces of equipment that were broken were located in a single city. This data revealed that city governments are generally managing to maintain or replace equipment. The most striking data refers to a single city, whose internal policy must be having problems with maintenance. As the authors cited on this topic pointed out, some city governments partner with private companies to ensure equipment maintenance, while in others it is not clear which sectors are responsible for outdoor gyms (Abade; Pereira, 2021; Costa; Freitas; Silva, 2016; Minas Gerais, 2017).

The equipment and its uses are indicated by information signs. When observing these, it was found that there were no signs in 75.9% of the squares, while there were signs with general instructions (10.3) and specific instructions (13.8) in some squares. This data is extremely important for users to have access to information on how to use this equipment. As presented, other authors have already mentioned the need for professionals to guide and monitor users (Abade; Pereira, 2021), and in the absence of such professionals, one way to guarantee this would be information signs with specific information on how to use the equipment, so as not to cause injuries or discomfort (Costa; Freire; Silva, 2016; Silva *et al.*, 2016).

## 6 Conclusion

The results allow us to conclude that there is a supply of equipment for outdoor gyms from suppliers, and some of this equipment is intended for people with disabilities. The study of suppliers indicated the existence of 28 pieces of equipment intended for people with disabilities to perform motor activities outdoors. However, the data collected only indicated the presence of 14 of them, meaning this equipment is not always available in the squares visited.

The on-site visits to the squares where the outdoor gyms are installed revealed that: 1) there is a lack of signage (75%) on how the equipment can be used; 2) there is around 3 to 4% of the equipment intended for people with disabilities in most of the cities where the collection was conducted; 3) the equipment is generally well maintained, with the exception of one of the cities where the collection took place; and 4) access to outdoor gyms needs to be renovated, mainly adequate ramps and correction of danger points.

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