ACROSS THE WHEELS: A STUDY OF ACCESSIBILITY FOR DISABLED PEOPLE AT SPORT PRACTICE

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ABSTRACT

This study aims to investigate the access of wheelchair users at sport practice in city of Rio de Janeiro. The methodology was based on the sports management framework presented by Brazilian Paralympic Committee (CPB), and subsequent questionnaire application. After that, the principal results were mapped to show the current adapted sport offer for wheelchair users. As outcome was found that the major problems are the communication barrier, and the accessible infrastructural characteristics (about public transit specially).

KEYWORDS: *Adapted Sports, Wheelchair Users, Public Transit and Urban Furniture.*

BACKGROUND

The benefits derived by practice of physical activities and/or sports are mentioned on literature from different perspectives, and cover different social groups. Factors such as the development of motor skills, increase of self-esteem and greater social interaction are commonly cited like the general responsible for the improvement of life quality of the practitioner. This premise is not different when considering Persons with Disabilities, that according with the International Classification of Functioning, Disability and Health – ICF, released by the World Health Organization - WHO (2011) are people with some kind of incapacity derived not only from body structural limitations, but also influenced by environmental and social factors. In this case, other aspects like a social insertion, rescue of autonomy and good psychological conditions, sum to table of benefits related of sport practice (Soler, 2005 *apud* Moreira, 2007), especially if consider disabled by trauma after birth and prevention of pathologies linked to a sedentary condition can be purchased for this portion.

According to the IBGE (2010) Brazil has more than 45 million of disabled, what is 23,9% of total population. In the city of Rio de Janeiro 27,487 citizens have declared themselves unable to walk or climb stairs without help from others. In spite of this expressive number and the laws that guarantee the right to equality, there are a gap between what has guaranteed and what is daily lived by disabled. This problem is acknowledged by Cohen (1998), who expands this situation for other countries and explain the shortage of incentives for sportive activities to recovery, leisure or competition.

The positive results obtained by Brazilian disabled athletes on last international competitions of great importance to the high performance sport (Guadalajara Pan American Games - 2011 - and London Paralympics - 2012) stimulated the public and private initiative to develop measures to popularize the sport / physical activities by disabled people.

The Brazilian Paralympic Committee - CPB - maximal organ of high performance sport representation, is responsible for articulating the national organizations of each modality for the Brazilian participation in international competitions. Is also responsible to promote the democratization of access to sport for disabled people. For this, is available in it website the Sports Management framework - which shows the national and international federations, and the Paralympic modalities related with each one. Starting from this reference, become possible know the practice sites of adapted sports offered on city of Rio de Janeiro.

Understanding the importance of the sport practice and the initiatives that are emerging on Brazilian context, is shown necessary highlight that the right over the opportunities only can be guaranteed (with autonomy and quality), when the access conditions are according with the population needs. Think about urban space, searching attend to every users, is necessary the preoccupation with public transit and sidewalks that permit the circulation and the Universal Accessibility (Bradshaw, 1993 *apud* Mello, 2012; Duarte e Cohen, 2006 *apud* Cordeiro *et al*, 2009). In this sense, this research aims to know the offer of adapted sports for disabled people who need to use wheelchair. This group was chosen because of the difficulties for locomotion. So, finally, aims to observe the offer and its possible concentrations and evaluate the transport influence on admission and permanence in sportive practice.

METODOLOGY

The conception of this research was based initially on literature review relating to the themes that permeate the universe of the study. After that, the efforts to survey primary data were made by contacting centers/clubs (related with CPB) which offer wheelchairs users practices adapted. The figure one presents de steps followed:

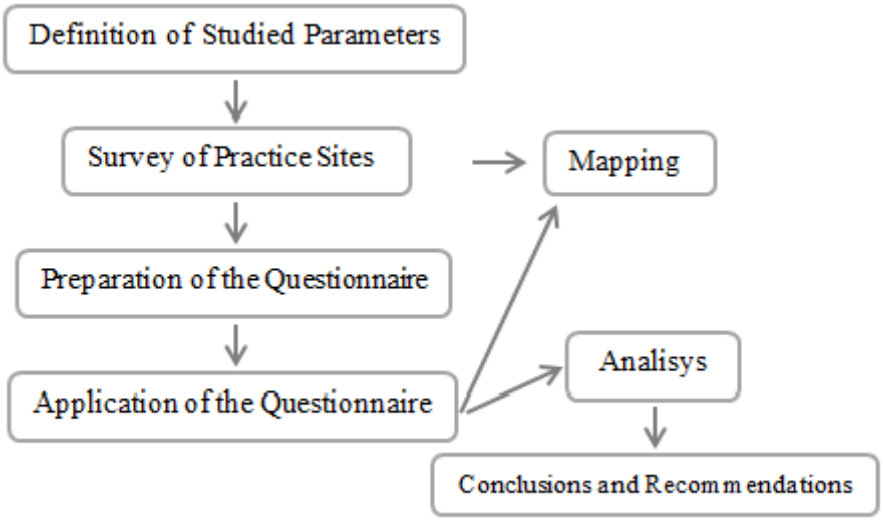


Figure 1: Adopted steps

The considered parameters permeate all objects that are studied here. The table 1 show the synthesis:

Table 1: Reference Table

Study Objects	Considered Groups	References
Adapted Activities	Parasports	Questionnaire
		Literature Review
Definition of Groups	Spinal Cord Injury	Literature Review
	Amputation	
	Spina Bifida	
	Chronic non-progressive encephalopaphy	
Public Transit	Bus	Observation
	Subway	
	Train	Literature Review
Urban Furniture	Accessible routes	Observation
	Pathways / Sidewalks	Literature Review

The survey of clubs which offer adapted sports on City of Rio de Janeiro was made based on sports management framework shown by CPB on its website. On this are shown the responsible federations for Paralympic modalities. From which became possible the mapping of the practice sites available, like their respective contacts (utilized at data collect).

Then, we developed a questionnaire sent by e-mail to those responsible for clubs listed in the previous step. However, due the low amount of respondents, the contact was being performed by telephone.

The obtained results were analyzed and mapped, in order to offer a contribution towards facilitating access to adapted sports practice within the spatial area of the city of Rio de Janeiro. Considering that this city will receive some of the most important mega-events of the world (World Cup FIFA - 2014 - and summer Olympic and Paralympic Games - 2016), studies that address the accessibility conditions for physically disabled show up relevant. This contributions can help on search for solutions that can include this part of population on all practices of those events and, widely, can help improvements on life quality.

DEFINING PARAMETERS

Disabilities Considered

Searching to understand the main needs about the displacement in urban space for a person with physic disabilities, considering more of what is guaranteed by law, will be presented some important aspects about this portion of population. It's important explains that because of the complexity about the subject, the following paragraphs aim a general vision about the physic disabilities (importants for this work). The term "disabilities" is defined in the Decree Nº 3.956/2001, article 01, as:

> (...) physical restriction, of mind or sensory, the nature could be permanent or temporary, that limits the capacity to do one or more activities essentials life daily, caused or aggravated by the economic and social ambient. (BRAZIL, 2001).

Beyond this classification, Gorgatti e Costa (2005) delimits five groups of disabilities: physic, intellectual, visual, hearing and multiple.

According with Fonseca (2008) the physical disability is a motor impairment and could be originated from neurological, ortopedic, congenital malformation or acquired by life factors. The principal reasons are prenatal, perinatal and postnatal, see table 2:

Table 2: Possible causes of physical disability

Prenatal	Perinatal	Posnatal
1- Attempting abortion	1- Anesthesia in excess	1- Severe malnutrition and dehydration
2- Congenital malformation	2- Trauma during the port	2- Urban violence
3- Pathologies (syphilis, toxoplasmosis, diabetes, rubella, meningitis)	3 - Lack of oxygen (Hypoxia)	3- Trauma (like diving into shallow water, traffic accidents, sports and work accidents)
4- Intoxications	4 - Use of Forceps	4- Infections
5- Side effects of drugs	5- Prematurity	5- Circulatory changes
6- Exposure to radiation		6- Cerebrovascular accident (CVA)
7- Genetic disorders		
8- Malnutrition		
9- Trauma during pregnacy		

In Brazil the most common causes are traumas of social character, like: falls (with emphasis on domestic accidents and diving into shallow water), urban violence (melee or with weapons) and traffic accidents, as exposes Campos et al (2008). Diehl (2006) emphasizes the importance of an awareness of the population about the theme as far as possible to prevent these factors, that may be responsible for serious sequels or even death, increase their proportion in society today. According by Decree Nº 3.298(1999), article four, there are different forms of motor disability generated by physical disability, like the amputation or limb absence, non-progressive chronic encephalopathy, nanism, congenital deformities in body parts and some classifications in accordance of the body segments committed. This classification use prefixes to determine the part of body affected and a suffix to determine if has or not holdover of moviment, see table:

Table 3: Prefixes and suffixes used in classification

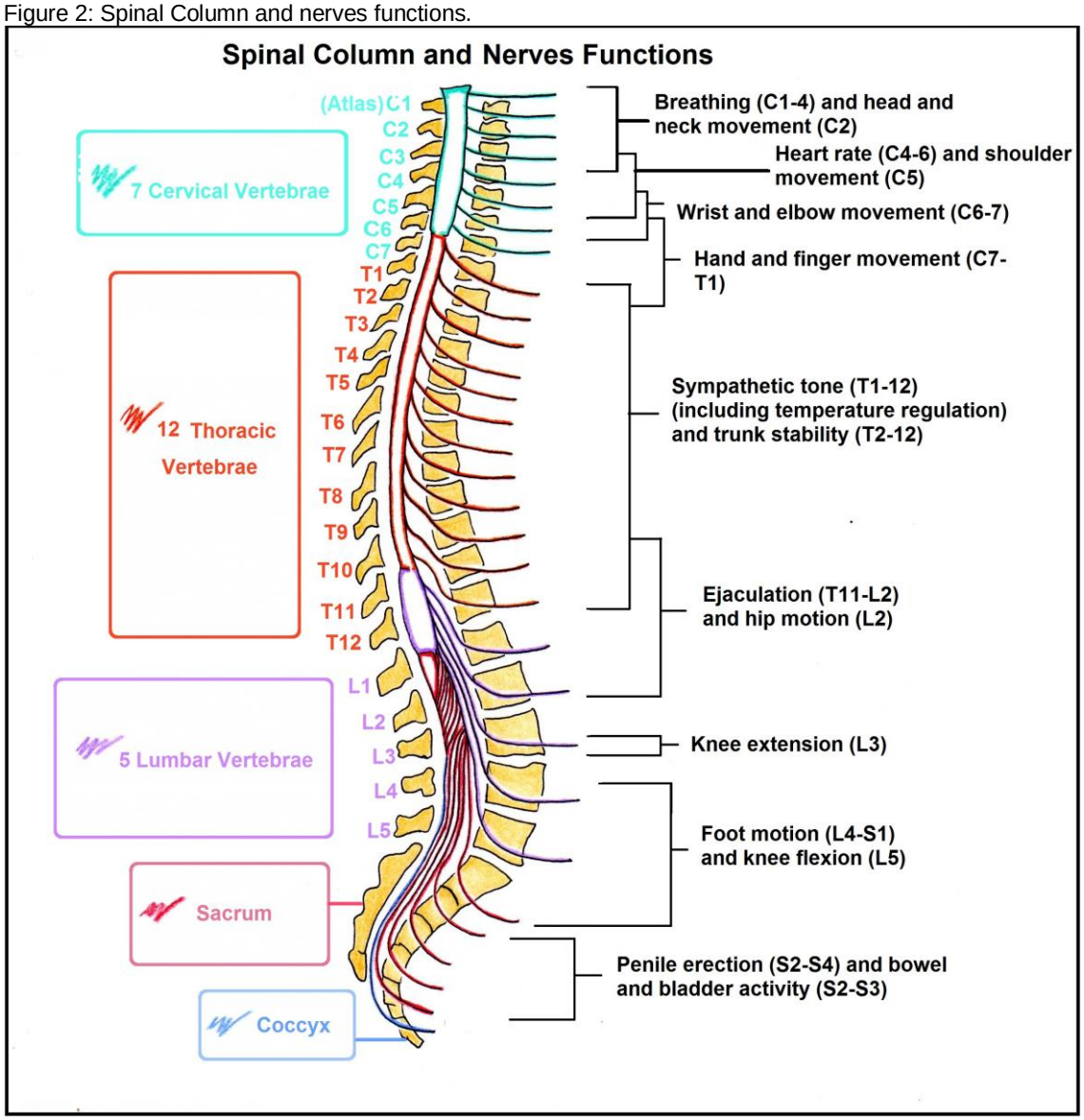
Prefixe:	Body segments committed:	Suffix:	
Quad-	Legs, arms on equal conditions	-paresis	holdover movement
Tri	Three members affected		
Para-	Lower limbs (LL)		
Di-	Upper limbs (UL)	-plegia	no movement
Mono-	Only one member is affected		
Hemi-	One side of the body is committed		

Pointed by Salles (2011) as the main physical disabilities, considering individuals with reduced mobility, which are: spinal cord injury (SCI), amputations (LL), sequelae of poliomyelitis, spina bifida and also the non-progressive chronic encephalopaty. As follows:

Spinal Cord Injury (SCI):

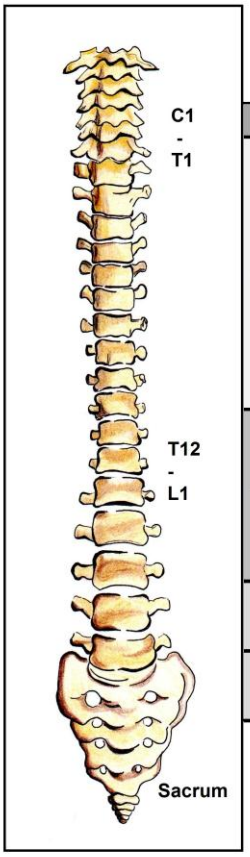
The physical disabilities originated by SCI are caused for commitments in Spinal Cord, which could occur by traumatic injury direct or indirect.
The spinal cord is part of the Central Nervous System (CNS), presenting as a continuation of the bulb and extending from Atlas to the second lumbar vertebrae (L2), regions of the spinal column, (Fonseca, 2008).The spinal column consists of vertebrae and classified according to their body region.
In addition to its primary function (support body), the spine has a vertebral canal with openings between the vertebrae (foramina) enabling the output of spinal nerves arising from the spinal cord. Our neural network makes up the Peripheral Nervous System (PNS) (Spence, 1991) includes two types of nerve fibers: sensory or afferent fibers - leading the messages captured by our body to the spinal cord and brain - and efferent fibers or motor - carrying messages from the brain and spinal cord to other parts of the body (Fonseca, 2008). We highlight here the spinal canal as conductor of nerve impulses, from which are derived the functions Sensory and Motor, as seen in Figure 2:

Figure 2: Spinal Column and nerves functions.



Thus, according by the trauma the individual may have several consequences, like losing all or part of sensation below the site where the injury occurred, muscle paralysis, loss of local innervation, and of stimulus control pressure and impact, develop frameworks ulcers and osteoporosis, among others.

The motor and sensory functions remains engaged below the level of the lesion, therefor the closer the top of the spinal will be increased the consequence of trauma. Figure 3 shows a simplification of place and consequence of injuries sustained in the spinal cord, based on the bone structure of the spine (Diehl, 2006; Fonseca, 2008).



Level of injury		Some effects
Cervical	C1 - C5	Paralysis of the muscles used in breathing and all the muscles of the upper and lower limbs.
	C5 - C6	Paralyzed legs with slight bending capacity of the upper limbs.
	C6 - C7	Paralysis of the lower limbs and part of the wrists and hands.
	C8 - T1	Paralysis of the lower limbs and torso, hands paralyzed.
Thoracic	T2 - T4	Paralysis of the lower limbs and torso: loss of sensation below the nipples
	T5 - T6	Paralysis of the lower limbs and torso: loss of sensation below rib cage
	T9 - T11	Paralyzed legs: loss of sensation below the navel
Lumbar	T12 - L1	Paralysis and loss of sensation below the groin
	L2 - L5	Different patterns of weakness of the lower limbs
Sacrum	S1 - S2	
	S3 - S5	Loss of bladder control and of the intestines

Figure 3: Level of injury effects.

Spina Bifida

Spina bifida is a congenital malformation of genetic origin of Nervous System, where the neural tube (embryonic structure that gives rise to the brain and spinal cord) does not close completely and consequently ends up generating an irregular closure of the vertebrae (so bifida) and opening in the spine. Its main causes are prenatal, listed in Table 2 (causes 3, 4 and 8), which in addition to genetic factors are responsible for affecting the development of the CNS.
There are three main types found in the literature: Myelomeningocele, Meningocele and spina bifida occult. The group of individuals chosen to permeate the findings of this work fits into the first kind here mentioned, Myelomeningocele. The most common among the three forms is also the most severe, presents the characteristic of externalization, through an opening in the spine, of the coating of the spinal cord and cerebrospinal fluid, both with protection functions and part of the spinal cord. Due to this factor the possibility of serious consequences in case of non-prevention are imminent (Fonseca, 2008).

Polio

Usually known as "Infantile Paralysis" is a viral infection (poliovirus) that results in paralysis, usually caused in the lower limbs, occurring suddenly. Its main features are sagging muscle, asymmetry, areflexia segment and preservation of sensitivity (Available at:

portal.saude.gov.br/portal/arquivos/pdf/gve_7ed_web_atual_poliomielite.pdf) According to Diehl (2006) poliovirus lodges in the spinal cord, destroying the motor cells.

Chronic Encephalopathy not Progressive

It is known as "Cerebral Paralysis" although this is not the best term, since the brain is unable to properly control motor functions, and not paralyzed. A Encephalopathy Chronic not Progressive is a injury that affects the central nervous system during its development and generates a motor disorder, and a sensory disorder in the development global and fine of the individual. The main causes, pointed out by Sanchez (1990 apud Diehl, 2006) are occurring in the perinatal period (2, 3, and 4 of Table 2). There are three subgroups: spastic, athetoid and ataxic. Considering the focus of this work will be presented the group with the highest incidence of wheelchair users.

The Chronic Encephalophaty not Progressive spastic, considered of the highest incidence and the only one who can provide intellectual impairment, is caused by a lesion located in the motor cortex, which is divided into the primary motor cortex, premotor area and supplementary motor area, and located in the frontal lobe brain. The primary motor cortex is responsible for conducting precise and delicate movements, the premotor area by functional movements of the hands and fingers, as well as the movement of the torso, legs and shoulders; In supplementary motor area exists bilateral contractions and movements of grasp simultaneously and functionality in conjunction with the premotor area.

Amputation:

Is the loss or removal of one (or more) arms or legs may be unilateral or bilateral, with orthopedic origin. The causes of this disability may be prenatal (congenital malformation and intoxication) and postnatal (infections, tumors, sequelae of diabetes, trauma etc). Unlike other physical deficiencies cited in this work, amputation does not get the ratings for the affected segment of the body (Table 3). One of the classifications used notes the location and residue of the amputated limb, can be considered complete or partial (Diehl, 2006).

Within the proposed brief explanation about some of the disabilities it is worth mentioning some important points from the viewpoint of performance and motor skill necessary for this portion regarding their mobility and wheelchair users as citizens. It is known that certain aspects related to motor performance and skills are needed by wheelchair, as reinforces Diehl (2006). The author points out that to move the chair safely and autonomously it is necessary for the driver to have great strength and skill in the upper limbs due to the level of demand for effecting the movement of force to move, maintain balance in the chair and others activities not concerning to their displacement. But this can cause overloading of the muscles of the upper segments due to constant and intense application. One possibility to prevent this overload is to improve engine performance through physical activity, which leads us to observe the

path to realization of sports for wheelchair users in the city of Rio de Janeiro, which by daily observation, presents great challenges for anyone.

Adapted Transit Systems

Initiatives that aimed the adaptation of public transit can be seen in many countries. According with Bromley (2007), the transport is one of the responsible factors for limit the mobility of disabled on urban centers. The safe and autonomous displacement is a fundamental aspect for life quality and social justice promotion. In this sense, this section will show a short description of the adaptations found on the research area.

Several cities exhibit inclusive characteristics in their public transit systems, like in Barcelona (Spain), Sydney (Australia), Tucson (USA), London (England), among other. Meanwhile, cities and countries which have fleet fully adapted (as the examples of Sweden and the city of Geneva – Switzerland) still represent isolated cases to be followed (Pinto, 2012). At sporting mega events context, the cities of Barcelona and Sydney exhibited significant advances because of the games. London is another city with high level of inclusive accessibility (improved by the needs imposed by the 2012 Olympics). In addition to the bus system, subway and train, the city have two more highly adapted system: The *Trans* (downgraded buses with bigger capacity for wheelchair) and the DLR (railway system considered completely adapted) (Pereira *et al,* 2012).

The adapted transport available on city of Rio de Janeiro has some similar characteristics with some cited cities - like the hydraulic lifts in buses and vertical lifting platforms in subway stations. To contextualize, will be realized a brief description of the accessible characteristics of the public transit systems on Rio.

The adapted buses started to be made, following the standards required by Decree 5296/04, in October 2008. Nevertheless, only next year that 500 of these vehicles began to circulate. Estimated that in 2014 all fleet of 8000 buses will have the required changes (Available: www.andef.org.br; Fetranspor, 2009). The adaptations consist on reinforcement of the vehicle, hydraulic lifts with boarding and landing platforms on level and reserved space for wheelchair (with one tilting seat for companion). The lift are, usually, in front of the adapted space for accommodate the wheelchair, being triggered by a control which stays in the drive's possession. The operation must be realized by the driver, and consists of brings it to ground level (sidewalk level), where the wheelchair user is accommodated in the platform that rises to the height of the vehicle floor and after returns to the initial position (two steps stair). During the operation a beep signal the process, and vehicle with these adaptations have the International Access Symbol. The reserved area have guardrail, seat belt for the wheelchair user and a short handrail, thus being, according with the NBR 14022.

The subway system has adaptations in their compositions and stations. The initiatives that will be mentioned on this paragraph can not be found in all dependencies, but, in general, the mode features a number of facilities for wheelchair users The Stations

have ramps of 8,33% of maximal slope, linking the street and the mezzanine in the most cases; lifts for level differences higher than 4 meters, and vertical platforms (controlled by employees) when lesser; marking for boarding of wheelchair (generally on first and last wagon). Four of the station of the system (new stations: Cantagalo, General Osório, Siqueira Campos e Cidade Nova) are with all the shown adaptations (added with those made for other disabled) and will receive complementary wherewithal. The compositions have reserved spaces for wheelchair users only in some wagons, where are a handrail support. The surface tubes have the *lowentry* buses (www.metrorio.com.br).

Comparing with other transport modes, the railway system of Rio show the bigger infrastructural shortages (facing to Disabled). Even in its principal stations (Central do Brasil) can be observed only few adaptations. Following the NBR 14021, some stations have lifts, and portable devices to win the gap (between the platform and the compositions), beyond training of the employees for the accessibility assisted.

Urban Furniture: Rules and Local Accessibility Improvement

As in the public transit systems, some initiatives that aims the micro accessibility starts to be largely seen, especially in big cities. Bogotá (Colombia) and New York (US) have suffered a restructuring on central area, remodeling the public spaces and expanding the pedestrian circulation area (Mello, 2012; Dutra *et al* 2009). In Brazil, the city of Belo Horizonte started, in 2002, a project named *Caminhos da Cidade* (City Paths) which aims (about urban furniture) the obstacles elimination, having, nowadays, tactile flooring, ramps among other changes. Londrina deserves featured too due the *Calçada para Todos* (Sidewalks for everybody) project (2008), that, as in the previous example, desires the inclusive spaces conception, based on Universal Design (Pinto, 2012).

Thinking on international examples, Barcelona will be mentioned by the pursuance of sidewalks free of barriers. As well as some projects in Brazil, the city sought the creation of spaces compatible with the Universal Accessibility. The legislation about disabled was created in 1996, with the Accessibility National Plan. Is estimated that, already in 2007, more than 90% of the city streets had adaptations (http://w3.bcn.cat/). Between what was the disclosed, there are ramps with low slope linking the bearing races and the sidewalks, and well conserved flooring (www.w3.bcn.cat/accessible). Other city that is studied in this research and that can be mentioned is Sydney, for give regular flooring sidewalks, with few barriers and wheelchair users circulation area. Other aspect that must be highlighted is the try of reduce the distance between the most important sites on city and the public transit terminals, taxis' spots and adapted parking (www.sopa.nsw.gov.au; City of Sydney, 2003).

In Brazil, the problems related with the accessibility can be seen even in the big cities. Even with 37,7% of total travel being realized by foot (ANTP, 2010) is possible observe sidewalks without paving, undersize, discontinuous surfaces (with different kinds of flooring, steps, garage ramps, and other) and poorly preserved (Dutra *et al*, 2009). The

sum of all this characteristics not only hampers the circulation of physically disabled, as can be determinant at choice of travel or not.

On Rio de Janeiro, the mentioned problems are observed even on suburb as on city center. Is notorious the barriers able to forbid the passing (or maneuver) of the wheelchair, the slope between the sidewalk and the pedestrian crossing, some cases doesn't exist or are poorly conserved, and the flooring is (in many situations) irregular. Considering the investments from the World Cup FIFA and the Olympics, the Rio's prefecture created o project Rio Acessível (Accessible Rio), that have the disables as the main beneficiaries. Some goals are the curb correction, obstacles removal, and implantation of ramps and level crossing (Pereira *et al*, 2012; Rio de Janeiro, 2012).

GENERAL RESULTS

As stated earlier, this study used as source of information the sports management framework presented by the Brazilian Paralympic Committee (CPB), which was compiled by the federations that have clubs located in the city of Rio de Janeiro. Based on the federation's websites, the practice sites and their contact information were selected. Thus, a total of 58 clubs were consulted but only 29 responses were successfully obtained. The difficulty in getting information was the main obstacle to the realization of this research and this represents one of the problems faced by people with disabilities interested in joining adapted sports. This situation reveals the existence of the Barriers in the Communications, understood as "any hindrance or obstacle which makes difficult or impossible the expression or the receipt of messages through the media or communication systems." (Ministério das Cidades, 2007, p. 35)

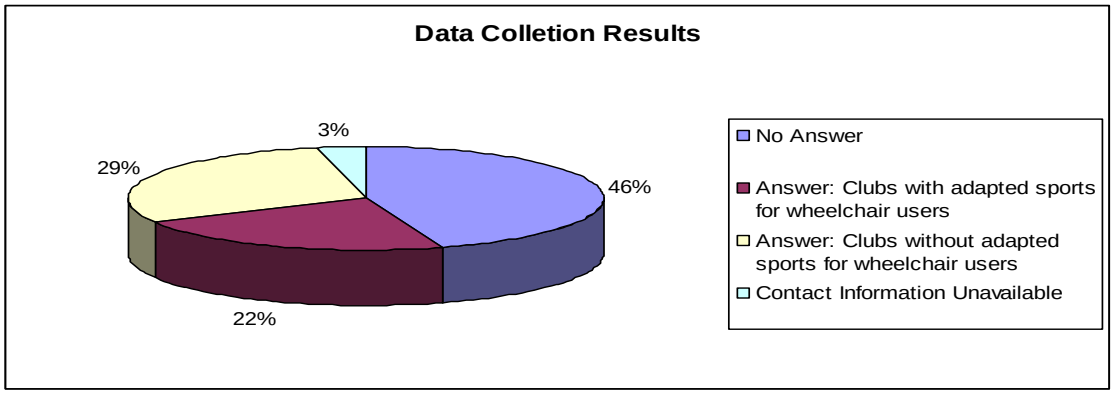


Figure 4: Results of contacts attempts

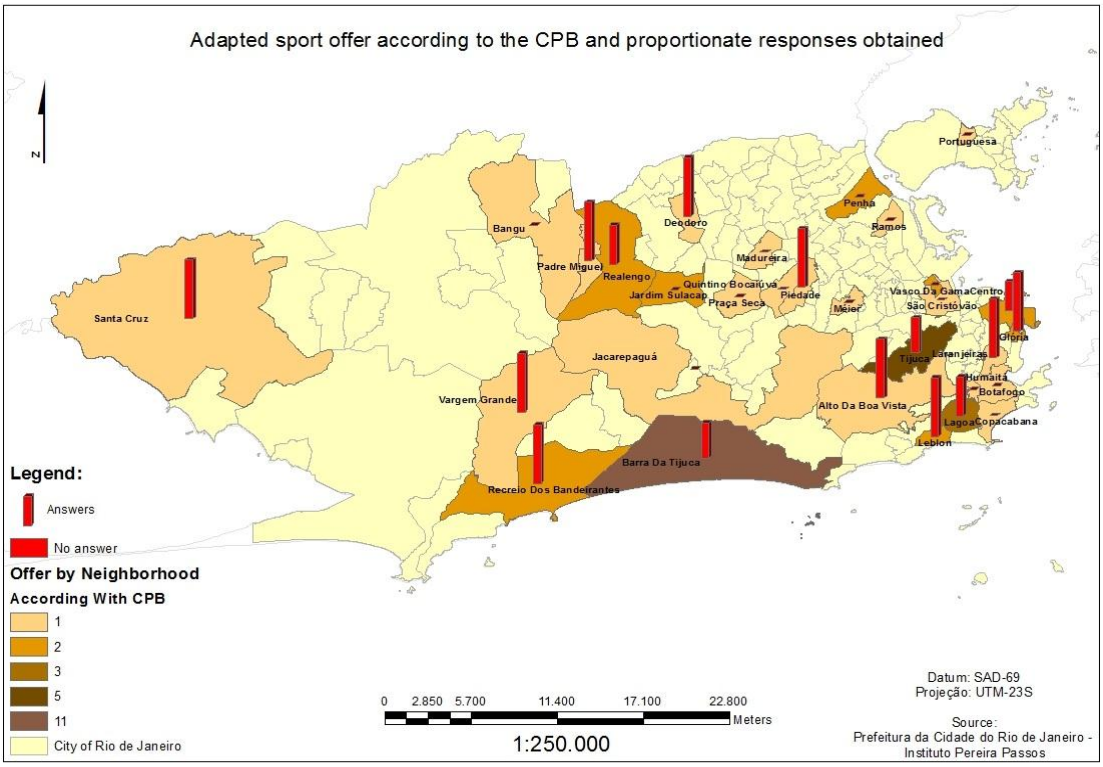


Figure 5 - Map with the adapted sports offered and the proportionate responses obtained

Other relevant problem found in the source of information was the existence of four sporting goods stores in the list of clubs with sports practices for disabled people. It is also important to inform the downgrading of several related sites contacts in the year of the data collection (2012). This means that, even with the choice of the country to host the Summer Paralympic Games, the access of information is still not prioritized in order to facilitate the accession of new potential athletes. For example: 1 club, that no longer exists, in two contacts was not found (not in those sites, nor in sites of search), 6 other clubs were with the wrong contacts or unavailable, any site linked to Curling Federation was disclosed and one club changes its localization.

For the questionnaires application, 22 clubs have had attempts of contact per three days, but they had not answered. In the 25 cases when contact was successfully performed, only 13 clubs have activities for wheelchair users (in these contacts only four clubs was difficult to obtain the necessary information), 12 clubs do not work with wheelchair users (and the difficulty in the contact occurred in 9 of these cases), and, three are in temporary pause.

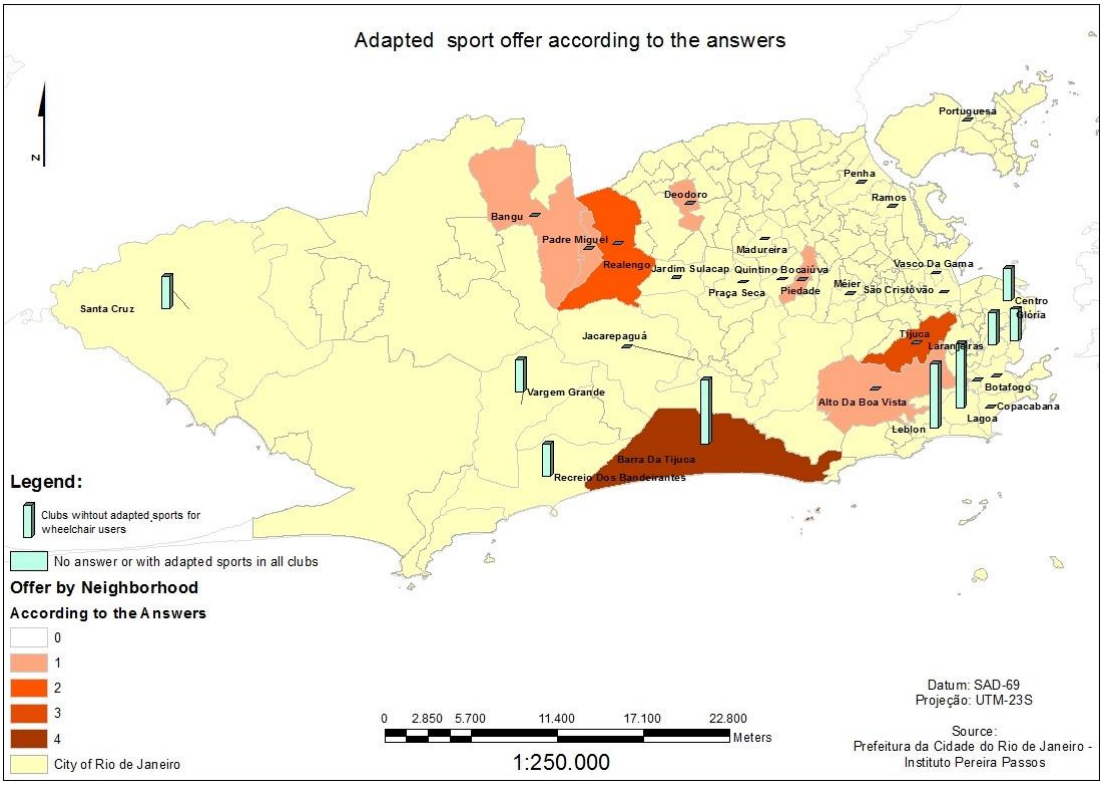


Figure 6 - Map with the adapted sports offered based on answer results

The responses of the clubs who offer sports for wheelchairs users reveals that the offer of this kind of sports has been growing in recent years, the most adapted practices began to be offered from 2000. The information collected with clubs participants of the survey show that five of them have their locations of the practice sites different than informed on the website of the Brazilian Federation - which means that the wheelchairs users in your initial search finds the nearest activity offer to their place of residence, but in practice he needs to move to another neighborhood. Figure X shows the real distribution of sites with sports adapted offer – excluding shops and spaces that do not work with wheelchair users, considering the real locations of clubs, and considering that the answers not obtained are correct and up-to-date their respective websites.

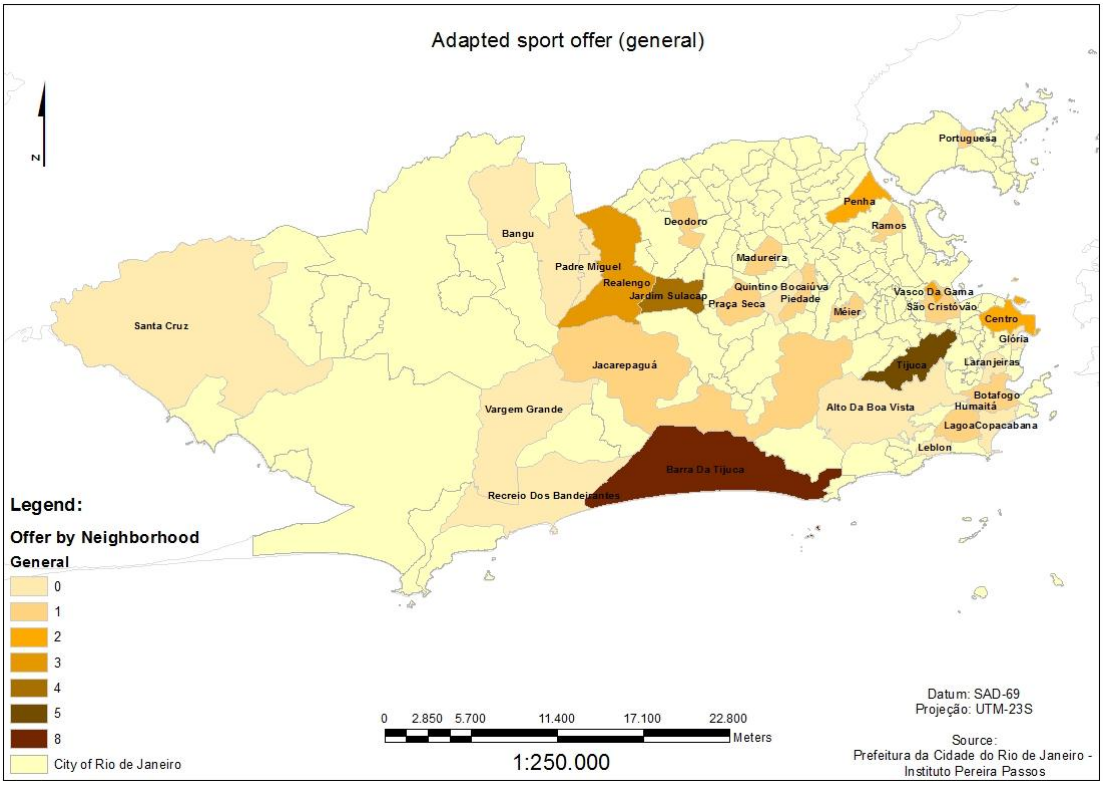


Figure 7 - Map with the adapted sports offered - Considering the information of federations as true and current.

The number of practitioners varies between 10 (clubs with a single modality - Rugby) to 110 (clubs with 4 modalities- on Basketball, Rugby, Tennis and Handball). Five clubs receive practitioners of all state of Rio de Janeiro, showing that sports are paramount in quality of life and self-esteem when all difficulties to attend the trainings are transposed.

Due to the lack of sponsorship and others adverse conditions, only 1 of the centers has special transport for the disabled practitioners. The principal reason for waiver was lack of appropriate transports. The number of waiver was considered like medium to high level by 3 participants (in the last year in five clubs there were no dropouts, two respondents did not know and two clubs indicated that ranged between 10 and 15 practitioners).

In general, about the limitations imposed by the public transit in Rio de Janeiro, respondents point out that in many cases there is no waiver because the initial ingress in the sports activity is impeded by distance. For those who choose to remain, the costs are high, and sometimes hinder the athlete's performance. Thus, the low quality of transit in Rio de Janeiro is the main reason for waivers and, in many situations, without private transportation there is no project.

ADAPTED SPORTS IN RIO DE JANEIRO: ANALYSIS AND SUGGESTIONS

As noted, this study reveals that the wheelchair users in Rio de Janeiro have difficulties not only to access the local of sports practice, but also they have problems to found reliable information about the provision of this service. Therefore, considering that one of the main goals of CPB is promote the universal access to sports for disabled people in various levels, it can be stated that, currently, this function is not being fully exercised in the city seat of the Olympics 2016.

Moreover, there is a heterogeneous distribution of clubs with adapted sports in Rio de Janeiro and generally they are located on the west side of the city, especially in the neighborhood of Barra de Tijuca and in the area north of the city, mainly in the Tijuca. The west side of the city is a region strongly oriented for private vehicle, with a low supply of public transit, composed of some buses and train lines, but that still does not supplying the entire region (Pereira, 2011). In the last year, 2012, a BRT - Bus Rapid Transit – station was opened in this area and three more stations are planned to be opened there until 2016. Also, there is a project to extend the metro line to Barra da Tijuca until the Olympic Games. Whereas, Tijuca's neighborhood has a good centrality and accessibility by public transit, with four metro stations, four train stations and several bus lines, however the micro accessibility, which is really important for wheelchair users, in this region is still lacking.

The influence area of the clubs with adapted sport offer for wheelchair users is quite large in Rio de Janeiro. Athletes are comes from many regions of the State and thus it represents a spatial concentration of the adapted sport offer in some places in the city. However, the most part of the athletes lives in the area near to the training club and this confirms the importance of the proximity and the access to the realization of this type of practice. The questionnaires show that the transports most used by the athletes with disabilities are the private vehicle and public buses, and most of then doesn't have special transportation. Accordingly, the waiver rates due access problems suggests the low quality of accessibility to disabled people practice sports in of Rio de Janeiro, and the mains problems are about public transit and microaccessibility.

CONCLUSIONS AND RECOMMENDATIONS

This research reveals that the initial hurdle faced by wheelchairs users to practice sports in Rio de Janeiro is the lack of reliable information. Although the CPB website disclose data about the Paralympics sports federations, its possible find some false and outdate information's. The participants of the survey by phone showed that many clubs don't have information about the activities offered to disabled people because the activities were made a long time ago or the clubs only rent the space for private projects. On others occasions, the information was not provide by the clubs due scheduling problems.

About the information available, this study recommended improvements and upgrades for the federation's websites and also the inclusion of information about the real site of sports practice for wheelchairs users. This information is really important because the athlete's displacement is evaluated as essential for the success of the sports practice by disable people and the most part of the projects don't have private transport to offer for their athletes (it's reveals that the sponsorship for this kind of activities is not enough), so they must be informed in advance about destination to which they will need to move.

It's possible concludes that the city of Rio de Janeiro doesn't offer the infrastructure necessary to autonomous and safe displacements for wheelchair users. This problem involves the designed of public spaces without the principles of the Universal Design: sidewalks, urban facilities, spaces for collective use, generally don't offer comfort and reliability to disabled pedestrians. The adverse conditions about microaccessibility can be observed throughout the city, especially in the suburbs of Rio de Janeiro (where the quality of life, in general, is lower). In this way, it is possible suppose that wheelchairs user's residents in some areas of the city will have good access to sports, cultural and leisure activities. This is because of the spatial inequalities heavily present in Rio de Janeiro. The city doesn't offer the right spatial integration, so, the citizens can't take advantage of all their opportunities – considering not only in the urban design and the public transit, but also the security and the supply of services.

About public transit for disabled people is important consider the improvements made recently in the subway and bus systems. Despite the compliance of technical standards imposed by the law, other aspects considered essentials about the infrastructure are not covered yet; maybe it happens because the disabled people don't participate in the planning process. Another important necessity is the provision of tools in adequate condition of use (Pereira et al, 2012).

Lastly, this study suggests improvements in the quality of information about sports practice for disabled people, mainly about the dissemination of information in the internet and updating the database. Also, it is recommended that this study be updated with a new framework of projects for wheelchair users, and maybe considering other kinds of disabilities. And, because of the quantity of disabled people in the Brazilian the population and the lacks of studies to benefit their quality of life, it is desirable that more researches be conducted about this subject. Associated with these, it is expected more positive changes in the accessibility for disabled people, and consequently the increase of the credibility and receptivity in surveys about inclusive accessibility for disabled people.

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