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Original Article

Analysis of accessibility and perception of people with disabilities in vessels

Análise da acessibilidade e a percepção de pessoas com deficiência em embarcações

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Abstract

Introduction: Marajó Island, located in the State of Pará, Brazil, is composed of 16 municipalities. Approximately 20.3% of its population has some type of disability, and the main means of transport to and from the island are vessels. **Objective:** To analyze the accessibility in the vessels used to transport people from the municipalities of Marajó Island to the state capital. **Method:** This is a quantitative-qualitative, descriptive and exploratory research conducted with 23 people with physical and/or sensory disabilities. Ten vessels were assessed. The study is divided into two stages: analysis of the perception of people with disabilities using a semi-structured interview, and analysis of vessel accessibility using a checklist based on the NBR 15450:2006 standard. **Results:** Most participants did not consider the vessels accessible and found difficulties in accessing and remaining on them. The analysis of the vessels showed that the averages of compliance with the norms in the evaluated spaces were <50%. **Conclusion:** There is agreement between the difficulties pointed out by the participants regarding the non-application of the NBR 15450:2006 standard, indicating that the lack of accessibility limits the access and mobility of individuals with disabilities who use water transportation in the Marajó Island region. Residents of Marajó Island with physical and/or sensory disabilities may be deprived of their basic right to come and go, facing barriers in their autonomy and independence regarding mobility and other occupations that depend on it.

Keywords: Architectural Accessibility, Transportation, Disabled Persons.

Resumo

Introdução: A Ilha de Marajó, no Estado do Pará, é composta por 16 municípios. Cerca de 20,3% de sua população apresenta algum tipo de deficiência e o principal meio para a saída e chegada da ilha é o transporte aquaviário. **Objetivo:** Analisar a

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acessibilidade em embarcações que transladam dos municípios da Ilha de Marajó para a capital do Estado. **Método:** Pesquisa quantiqualitativa, descritiva e exploratória com a participação de 23 pessoas com deficiência física e/ou sensorial. Dez embarcações foram analisadas. O estudo está dividido em duas etapas: análise da percepção das pessoas com deficiência por meio de entrevista semiestruturada e análise da acessibilidade das embarcações com uso de *checklist* baseado na norma NBR 15450:2006. **Resultados:** A maioria dos participantes não considerou as embarcações acessíveis e encontra dificuldades para acessá-las e permanecer nelas. A análise das embarcações mostrou que as médias de conformidade com as normas nos espaços avaliados foram inferiores a 50%. **Conclusão:** Há concordância entre as dificuldades apontadas pelos participantes e a não aplicação da norma NBR 15450:2006, indicando que a ausência da acessibilidade limita o acesso e a mobilidade de indivíduos com deficiência que utilizam os transportes aquaviários na região da Ilha de Marajó. Habitantes da ilha de Marajó (marajoaras) que apresentam deficiência física e/ou sensorial podem ser privados do direito básico de ir e vir, enfrentando barreiras em sua autonomia e independência com relação à mobilidade e outras ocupações que dela dependem.

Palavras-chave: Acessibilidade Arquitetônica, Meios de Transporte, Pessoas com Deficiência.

Introduction

More than 1 billion people in the world have some type of disability, which represents approximately 15% of the world's population (Malta et al., 2016). In 2010, according to the demographic census, there were about 45.6 million people with some type of disability in Brazil, that is, 23.9% of the population. It is noteworthy that, specifically in the State of Pará, the number of people with at least one disability was approximately 1.8 million, representing about 23.6% of the state's population - above the world average (Instituto Brasileiro de Geografia e Estatística, 2010; Brasil, 2012b).

According to Law 13.146/2015, a person with a disability is one who has a long-term impairment of a physical, mental, intellectual or sensory nature, which, in interaction with one or more barriers, may obstruct their full and effective participation in society on an equal basis of conditions with others. However, even with the advances in Brazilian legislation, which guarantees the rights of people with disabilities, including being a world reference, in practice, its effectiveness does not occur fully. With this, individuals with disabilities, unfortunately, still encounter many difficulties in the social environment. This study highlights the difficulty in architectural accessibility (Pereira & Saraiva, 2017). Accessibility, according to the Statute of Persons with Disabilities, is defined as:

> possibility and condition of reach for the safe and autonomous use of spaces, furniture, urban equipment, buildings, transport, information and communication, including its systems and technologies, as well as other services and facilities open to the public, of public use or private for collective

> use, both in urban and rural areas, by people with disabilities or reduced mobility. (Brasil, 2015, p. 1).

Based on this, it is inferred that accessibility is a main attribute of the environment, and that its implementation is fundamental, considering that through it, the improvement of the quality of life of individuals is guaranteed and positive social results are produced, since it contributes to inclusion. It is extremely important to emphasize that, in the absence of accessibility, people with disabilities have both their autonomy (the individual's ability to determine their own standards of conduct) and their independence (power to carry out their activities without interference or help from others) impaired (Burnagui et al., 2016; Santos et al., 2018).

Public transport allows its users to access different places, for example, work, home, among others, within the same municipality or externally (intercity transport). The Brazilian Association of Technical Standards (ABNT) defines specific standards for various types of transport, based on which criteria and parameters that must be observed are established to ensure safety, comfort and accessibility for users (Vieira et al., 2015).

The means of public transport vary according to the needs and structure of each region. In the Amazon region, one of the main means of transport is the waterway. This transport refers to the mode of locomotion that uses vehicles such as ships, speedboats, ferries, catamarans, among others, using water as a means of movement. In some locations, such as Ilha de Marajó, the waterway is the main and often the only means of transport, both for people and cargo (Moura & Frota, 2016).

Considering that each type of waterway transport has specific configurations and that some of them are more common in some municipalities on the Ilha de Marajó, it is important to clarify that speedboats are fast vessels that can have various sizes and formats and can be used to transport people or for sport; catamarans are vessels made up of two parallel hulls connected by a rigid structure, and both the speedboat and the catamaran are vehicles that have seats, that is, the passenger travels seated; ships, on the other hand, are considered any type of vessel that operates in the aquatic environment and are referred to as medium and large vessels that are found on the Ilha de Marajó with up to three floors – this type of vessel is generally responsible mainly for transporting passengers; and finally, the ferries, which are flat-bottomed vessels that may or may not have their own propulsion, intended for both cargo transport and passenger transport. Both on the ship and on the ferry, it is possible to travel in the cabin, where there are beds available, or in hammocks, which are on the passenger deck (Normas da Autoridade Marítima, 2003).

The structure of the vessels has several parts (Associação Brasileira de Normas Técnicas, 2006), but two names stand out here: the access device[1] and the passengers' deck[2] (Figure 1). It should be noted that on the passenger deck of ferries and ships, there are no seats, it is a free space where hammocks (domestic utensil produced with fabric, used to sleep mainly in the North and Northeast regions) are organized.

[1] Fixed or mobile structure/equipment used to allow access from the pier or pier to the floating platform and from there to the vessel, that is, it allows people or cargo to be loaded and unloaded from the vessel (Associação Brasileira de Normas Técnicas, 2006).

[2] Area of the vessel intended for the accommodation of passengers in seats or hammocks ad their movement around the vessel (Associação Brasileira de Normas Técnicas, 2006).

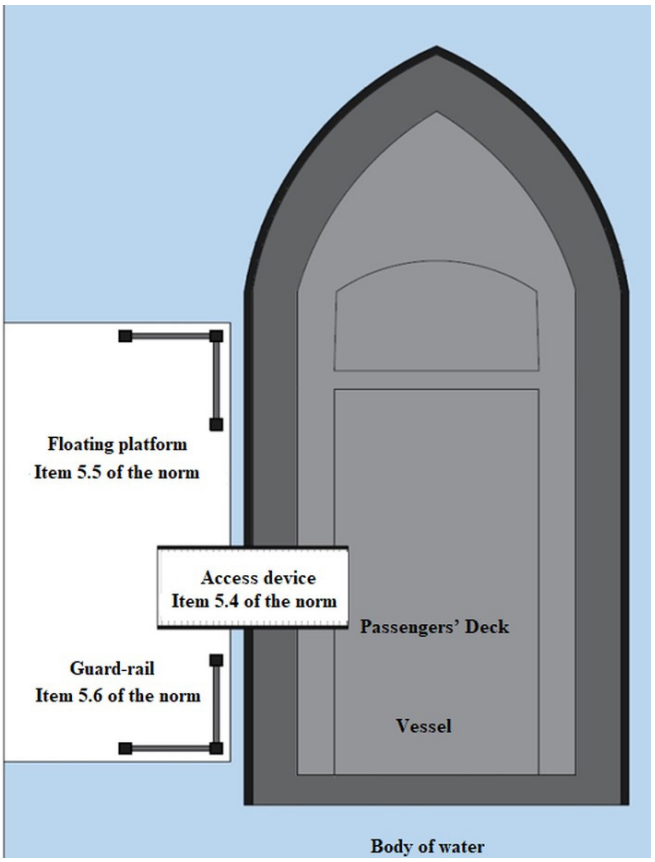

Figure 1. Embarkation/disembarkation equipment and passenger deck.

Ilha de Marajó is located in the state of Pará, and is considered the largest river-maritime island in the world. Politically it was made up of 16 municipalities[3] during the data collection period, namely: Afuá, Anajás, Bagre, Breves, Cachoeira do Arari, Chaves, Curralhinho, Gurupá, Melgaço, Muaná, Ponta de Pedras, Portel, Santa Cruz do Arari, Salvaterra, São Sebastião da Boa Vista and Soure. The island's population is approximately 487,000 inhabitants and about 20.3% of this population has some type of disability. This island is surrounded by a river on one side and the sea on the other, and, as a result, the main means of leaving and arriving on the island is water transportation (Instituto Brasileiro de Geografia e Estatística, 2010; Meguis, 2018).

Based on travel experience during the data collection period, to reach some cities closer to Belém, trips can take between 4 and 6 hours (depending on the type of vessel), while for cities farther from the capital from the State of Pará, the trip can last from 16 to 20 hours. Considering this considerable time on board, several activities are performed inside the vessels, for example, sleeping and activities of daily living related to food and personal hygiene.

In this context, considering that there is a high number of people with disabilities in Brazil, the guidelines of the ABNT norm (NBR 15450:2006) (Associação Brasileira de

[3] Currently, 17 municipalities are part of the Marajó archipelago, but the 17th was attached to the region after data collection, in the official state diary of the State of Pará, in 01/21/2022.

Normas Técnicas, 2006), which provides for the accessibility of passengers in the waterway transport system, and that the Statute of the Person with Disabilities guarantees the right to transport and mobility of the person with a disability or with reduced mobility, the purpose of this study was to analyze the accessibility of boats that transfer to the municipalities of Ilha de Marajó and the perception of people with disabilities about accessibility in this type of transport.

Method

Quantitative-qualitative, descriptive and exploratory study carried out through the project entitled "Study of accessibility, social participation in strategic locations in the Marajó archipelago and quality of life of its residents with disabilities", approved by opinion No. 4,871,778 of the Ethics Committee in Research on Human Beings, as required by the National Health Council (Resolution No. 466/12) (Brasil, 2012a).

Participants

The participants were 22 people with disabilities who live in 13 of the 16 municipalities that politically make up the Ilha de Marajó and who use water transport to go to Belém. The selection of participants was based on the following criteria: people aged ≥18 years, of both genders, with physical, visual or hearing disabilities, who signed the Free and Informed Consent Term. These participants were indicated by the teams from the Reference Center for Social Assistance (CRAS), Specialized Reference Center for Social Assistance (CREAS), Health Units and residents of the municipalities.

Ten vessels from the municipalities of Cachoeira do Arari, Muaná, Ponta de Pedras, Salvaterra, Santa Cruz do Arari, Soure, São Sebastião da Boa Vista and Portel were analyzed. These vessels were selected for convenience and were used by the team to reach the municipalities, or they were vessels that were in the ports of the cities.

Data collection instruments

Data were collected through a semi-structured qualitative interview consisting of 14 questions regarding the perception of people with disabilities about the accessibility of vessels, specifically about the accessibility of access devices, circulation areas, bathrooms, cabins and seats on vessels that transfer from your county to the state capital.

To evaluate the vessels, a checklist with 41 items was used based on the information recommended in ABNT NBR 15450:2006 (Associação Brasileira de Normas Técnicas, 2006), from which the accessibility of access to the decks, circulation areas and toilets of the vessels and, when present, cabins or passenger decks with seats were evaluated.

Collection environment and materials

The study was carried out in the 16 municipalities that make up the Ilha de Marajó. The interviews were conducted at the Basic Health Units (UBS), CRAS, CREAS and at the homes of the interviewed individuals. In addition to the environment of the

vessels that carried out the Belém line to the municipality where the accessibility analysis was carried out.

The script (Appendix A), built specifically for this study, was used to direct the interview with the participants and the checklist (Appendix B) was used to record the observations made on the vessels. In addition, materials such as voice recording devices, measuring tape and a camera were used, which allowed the recording of spaces observed on the vessels.

Procedure

The study was divided into two stages. First, the collection was carried out on the vessels where the checklist was completed by two researchers, and, in addition to the manual record, a photographic record of the areas of the vessels was also carried out; subsequently, semi-structured interviews were conducted with people with disabilities, which were recorded through audio recording. Data were collected between July and October 2021 by 12 researchers: seven students and five professors from the Faculty of Physical Therapy and Occupational Therapy at the Federal University of Pará (UFPA), who made up the overall project team.

Interview data were tabulated in Word software and checklist data were computerized in Excel software, which allowed statistical analysis.

Data analysis

All responses to the interviews were transcribed and analyzed based on Bardin's content analysis (Franco, 2018), which is a research technique structured in three phases: pre-analysis, categorization or coding, and interpretation of results (Sousa & Santos, 2020; Franco, 2018). This analysis took place with the help of the MAXQDA software (Verbi Software, 2019), using transcription and coding resources.

The items obtained through the checklist were analyzed using simple descriptive statistics – percentage of items corresponding to the norm, in order to identify how much each vessel that transports between Ilha de Marajó and Belém meets the accessibility norms.

Through the two analyses, it was verified whether the perception of people with disabilities who use this transport corresponds to the parameters observed on the vessels.

Results

Step 1: analysis of vessel accessibility

Ten vessels that carry transport lines between the municipalities of Ilha de Marajó and Belém were analyzed as follows: one vessel from each of the municipalities of Soure, Salvaterra, Ponta de Pedras and Cachoeira do Arari, two vessels from the municipalities of Santa Cruz do Arari and Muaná and two vessels from the region of Breves: a vessel that covers the municipalities of Portel, Melgaço, Breves, Curralinho and Bagre and a catamaran that sails to São Sebastião da Boa Vista, Curralinho and Breves. In the municipalities of Afuá and Chaves, there are no vessels that go to Belém and in the

municipalities of Anajás and Gurupá, there are vessels that make this route, but they were not in the city when data collection was carried out.

Regarding the type of vessel, five speedboats, two ships and three catamarans were analyzed. Figure 2 shows the percentage of checklist items that were in compliance with ABNT NBR 15450:2006 (Associação Brasileira de Normas Técnicas, 2006).

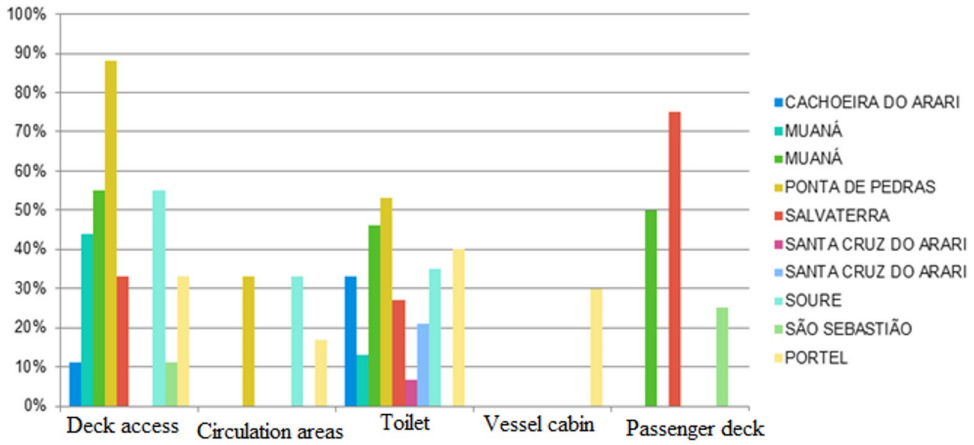

Figure 2. Percentage of the number of checklist items that were in compliance with ABNT NBR 15450:2006 (Associação Brasileira de Normas Técnicas, 2006).

Accessibility of access to vessel decks

ABNT NBR 15450:2006 (Associação Brasileira de Normas Técnicas, 2006) provides for the existence of an access device to the vessel with at least 1 meter of regular width, with baluster, protection and non-slip floor, with access to the specific deck, for people with disabilities, with a minimum width of 1 meter, with space between the access and the passenger deck, free of steps, with a minimum size of 1.50 x 1.20 m.

Only three vessels had a percentage greater than 50% (55, 55 and 88%) of compliance with ABNT NBR 15450:2006 (Associação Brasileira de Normas Técnicas, 2006), while the others had only 11,33 and 44% of items in compliance with the standard. The two vessels in the municipality of Santa Cruz do Arari did not have items in compliance with the norm and, therefore, did not reach any percentage of the norm. It was observed that, even when the access device existed, it did not have the necessary items, such as protection and the minimum required width.

Accessibility in circulation areas

Regarding circulation areas, the standard provides that they have a width between 1.20 and 1.80 m, free of obstacles, and if necessary to transpose objects, the width between them must be at least 90 cm.

On the vessels from Cachoeira do Arari, Salvaterra, São Sebastião da Boa Vista and Portel and on the two vessels from Muaná and Santa Cruz do Arari, none of these items were observed and, therefore, did not reach any percentage of the norm.

In the vessel's circulation areas at Ponta de Pedras, the space between objects reached a minimum of 1 meter, totaling 33% in this regard. In Soure's vessel, the circulation areas were free of obstacles, but did not have an ideal minimum width, making it necessary to transpose objects, thus scoring 33% of the items.

Accessibility of toilets

According to the standard, vessels must have isolated accessible toilets or toilets with accessible toilet signage with a minimum door width of 90 cm, emergency signaling devices, grab bars with a minimum length of 80 cm, height of the bar from the floor of at least 75 cm, located, respectively, behind and on the side of the toilet. The floor of the restrooms must have a regular, firm, stable and non-slip surface; toilet seats must be between 43 and 45 cm high and the flushing system must have a maximum height of 1 m. Washbasins must be between 78 and 80 cm high, have faucets activated by a lever, electronic sensor or some equivalent device, and have support bars on their sides corresponding to their height.

It is worth noting that the vessels at Ponta de Pedras, Salvaterra and Soure had a separate accessible toilet. Only one vessel had a percentage greater than 50% (53%) of compliance with ABNT NBR 15450:2006 (Associação Brasileira de Normas Técnicas, 2006), while the others had only 7, 13, 21, 27, 33, 35, 40 and 46% of items in accordance with the norm. On the São Sebastião da Boa Vista vessel, none of the items were in accordance with the accessibility parameters, so none of the items provided for in the standard were reached. It was observed that, even when there was an isolated accessible bathroom, it did not correspond to the standards set out in the norm.

Accessibility of vessel cabins

Only Portel's vessel had a cabin, and it was not accessible. The cabins available to passengers were not located on the main deck, did not have the minimum required width and switches and sockets were not among the suggested heights. To enter the cabin, from the deck, there was a difference in level, contrary to the norm. The minimum circulation area inside the cabin and the height of the bed did not correspond to the norms, while the height of the door handle was ideal. Thus, 30% of the items corresponded to the norms.

Accessibility of passenger decks

On the vessels at Cachoeira do Arari, Ponta de Pedras Soure and on one of the vessels at Santa Cruz do Arari, there are no areas designated for people who use wheelchairs and there are no preferential seats on the passenger deck, as a result of which no percentage of the standard. One of Muaná's vessels did not have seats, and for this reason this item was not analyzed.

The Muaná and Salvaterra vessels had spaces reserved for people with wheelchairs and preferential seats, but with characteristics or quantity that did not correspond to the requirements, reaching, respectively, 25 and 75% of items in compliance with the standard.

Finally, on the São Sebastião da Boa Vista vessel, there were no areas reserved for individuals with a wheelchair, only two preferred seats, but without retractable armrests, with 25% of the items complying with the standard.

Step 2: perceptions of people with disabilities

The general characteristics of the interviewed participants, 22 in number, highlighting gender, age, education, type of disability and municipality in which they live are described in Table 1.

It was not possible to interview residents of Anajás, Afuá and Chaves. In the first, none of the people indicated by the reference centers made the journey to Belém in the last two years. As for Afuá and Chaves, there is no vessel that goes to Belém. In addition, due to the geographic location, when specialized care is needed, residents need to travel to the capital of the State of Amapá, according to data collected from a resident of local.

The age range of the participants was from 20 to 84 years old, of both genders, most respondents were men (15), most had completed high school and used ship-type vessels more frequently and most had physical disabilities. The participants traveled to the capital in the last two years and made this trip at least once a year.

Table 1. Characterization of study participants.

Participant	Gender	Age	Scholarity	Disability description	Municipality	Vessel used
Subject 1	Male	59 years	Illiterate	Acquired physical and visual disability, with lower limb amputated, wheelchair user.	Muaná	Ship
Subject 2	Female	84 years	Literate	Acquired physical disability, reduced lower limbs mobility, walker user.	Ponta de Pedras	Speedboat
Subject 3	Male	38 years	Complete elementary school	Acquired physical disability, spinal cord injury, lower limbs paralysis, wheelchair user	Santa Cruz do Arari	Speedboat
Subject 4	Male	66 years	Illiterate	Acquired physical disability, amputated foot	Santa Cruz do Arari	Speedboat
Subject 5	Female	21 years	Complete high school	Acquired physical disability, tetraplegia, wheelchair user	Cachoeira do Arari	Speedboat
Subject 6	Female	48 years	Complete high school	Physical disability, congenital, lower limbs paralysis, wheelchair user	Cachoeira do Arari	Speedboat
Subject 7	Male	71 years	Literate	Acquired physical disability, lower limbs paralysis, wheelchair user	Salvaterra	Ship
Subject 8	Male	83 years	Literate	Acquired physical disability, lower limbs paralysis, wheelchair user	Soure	Speedboat
Subject 9	Female	52 years	Complete high school	Acquired physical disability, reduced lower limbs mobility, wheelchair user	Soure	Speedboat
Subject 10	Male	45 years	Illiterate	Acquired physical disability, lower limbs paralysis, wheelchair user	Soure	Ship
Subject 11	Female	56 years	Complete higher education	Acquired physical disability, reduced lower limbs mobility, wheelchair user	Portel	Ship
Subject 12	Male	50 years	Complete high school	Acquired physical disability, lower limbs paralysis, wheelchair user	Portel	Ship
Subject 13	Female	30 years	Complete elementary school	Physical disability, congenital, reduced upper limbs mobility, lower limbs paralysis	Breves	Ship
Subject 14	Male	33 years	Complete elementary school	Physical disability, congenital, reduced upper limbs mobility, lower limbs paralysis, wheelchair user	Breves	Ship
Subject 15 Marlene	Female	54 years	Incomplete elementary school	Acquired physical disability, reduced lower limbs mobility, crutches user	Gurupá	Ship
Subject 16	Male	64 years	Complete high school	Acquired physical disability, lower limbs paralysis, wheelchair user	São Sebastião da Boa Vista	Ship

Table 1. Continued…

Participant	Gender	Age	Scholarity	Disability description	Municipality	Vessel used
Subject 17	Male	23 years	Incomplete elementary school	Acquired physical disability, reduced lower limbs mobility, crutches user	Bagre	Ship
Subject 18	Male	27 years	Complete elementary school	Acquired physical disability, paraplegia, wheelchair user	Curralinho	Ferry
Subject 19	Male	43 years	Incomplete elementary school	Acquired physical disability, lower limbs paralysis, wheelchair user	Curralinho	Ship
Subject 20	Female	32 years	Incomplete elementary school	Acquired physical disability, lower limbs paralysis, wheelchair user	Curralinho	Ship
Subject 21	Male	25 years	Complete elementary school	Acquired physical disability, lower limbs paralysis, wheelchair user	Curralinho	Ferry and Ship
Subject 22	Male	20 years	Complete high school	Congenital visual impairment.	Melgaço	Ship

Source: Field research.

To carry out the content analysis, the words Motive (the participants' need to go to the state capital) and Difficulty (difficulty or not to access and use the vessels) were listed as registration units.

Category 1: motive

The word Motive was chosen as the registration unit, as it is important to understand the reasons why individuals move from their municipalities, considering that the reason may be related to different activities of different occupations.

Among the participants, the most frequent reasons for traveling to the capital are consultations, exams and treatments linked to their health. It is worth noting that 21 of the 22 participants listed health-related reasons first. However, it is observed that, in addition to the reason related to health, some reports highlight the reasons for going to visit/reencounter relatives who live in Belém, accompanying family and friends during the trip, shopping, traveling for work and participating in religious events, as shown in Table 2:

Table 2. Some of the participants' reports about the motive for going to Belém.

[...] *I go to the doctor's appointment.* (Subject 1).
Only when I really get sick, only when I need the doctor. (Subject 7).
The device itself, consultation of the device. (Subject 9).
Sometimes when they call me to the capital, sometimes it's for work, I go to do my work and often to visit family, accompany friends, accompany a relative who sometimes goes too. (Subject 22).
[...] *health issues and church issues too, I go a lot, to the pastors' convention.* (Subject 12).
[...] *Uhm... Doctor's appointments. And our family, the boys live there…* (Subject 2).
[...] *Go shopping, because sometimes I do my shopping in Belém, which I think is more favorable* [...] (Subject 2).

Source: Field research.

Category 2: difficulty

The word Difficulty was used as a recording unit in the second category of analysis. This word was found in several moments of the interview, in the reports about the accessibility of access devices, circulation areas, toilets, cabins and seats on the boats. Table 3 presents some of the participants' reports.

Table 3. Some of the participants' reports on accessibility of areas of the vessel.

Guiding question: When traveling, was the "ramp" that gave access to the vessel accessible, that is, anyone could get in and out without difficulties?
Yes, it's because if I go in it [wheelchair], *I believe so because it works... it's all full of those little lumps, right? It doesn't go only one way* [...] (Subject 1).
No, I had [difficulty]... *I would go there to the port and from there I would walk holding on. From one side the other.* (Subject 2).
No. They are ramps, but they are not accessible ramps, they are not accessible at all. Sometimes it's a wide plank they put for us to cross over there. (Subject 12).
No, but when, there is no accessibility. [...] *there is no accessibility for a wheelchair user to enter without someone carrying it, even on the vessel itself, you know, there are usually two "passadisse", right, first and second, then when we go on the second one, we have to carry it because there's no accessibility, it's just a normal staircase, only for physically fit people, for wheelchair users there isn't.* (Subject 16).
It's difficult [...] *Because there isn't one, then it's difficult to get off the boat, see?* (Subject 6).
No [...] *I need to be carried to be able to put me on the chairs. I have to stand up, I have to go over the bridge, so I have to go down the stairs, I need to be carried* [...] (Subject 5).
Guiding question: In areas where people circulate (e.g. corridors), could anyone walk without difficulty?
[...] *where I sat, I stayed. But if you needed it, it wasn't difficult.* [...] *Well, depending on the situation, there would be* [difficulty]. (Subject 2).
No [...] *Even because the chair only comes in at the beginning, there are two armchairs in the front. Behind it, there is no way to enter.* (Subject 3).
Look, the boat has a part that allows me to use my chair to go to the bathroom [...] *then the boat has something for me to go to the bathroom, I have to go back* [...] *Sometimes I stay in the back and sometimes they tell me boot, in front according to the passages.* (Subject 8).
Only people who are normal, wheelchair users cannot, there is no space. (Subject 20).
Guiding question: Were the toilets on the vessel easily accessible and would anyone be able to use them without difficulty?
Everyone would be able to. (Subject 17).
No. [...] *it wasn't difficult... the other express they had was wider, the chair even reached the bathroom, access was good. But not these others* [...] *this one, none of these the chair can get close.* (Subject 3).
I never used it because of having to get on the boat and sit there until I got to Belém [...] (Subject 5).
[...] *Very little, because there are no conditions, you know?* [...] *No, it's not, for me a wheelchair user. For you to have an idea, a chair like that doesn't even go into the bathroom.* [...] *it is complicated! I think, I just said to you and I repeat, we are not respected as wheelchair users, right?* (Subject 7).
No, the toilets are not accessible, they think it is [accessible], *the owner of the vessel thinks it is, but it is not. The ramps are always horrible, sometimes they put it like... it's like a... a speed bump that they put on the door of the toilets that are hard to get in, hard to get out of and inside there's no... there's nothing for you to hold on to, there's no wheelchair for you to take a shower, there's nothing.* (Subject 12).
I don't use the bathrooms, because they are not accessible. (Subject 18).
Guiding question: Was the vessel's cabin easily accessible and could anyone use it?
No, no... We can't get in the door if we don't have help, it's so high, there's no accessibility in the cabins or in the suites. (Subject 12).
Neither. The bathroom inside was also small, the door was this small and the walker... I'm glad my walker is the one that closes so I can move it [...] (Subject 11).
Yeah! [...] *On the second trip, it was more difficult on the second because I stayed on the second floor, right, in the second-floor cabin of the vessel.* [...] *Suspending myself for "those" machines like that, right? Did you understand?* [...] *then, to be able to enter, you have to carry the chair because there is always that space in front of the cabin, then you cannot get in, but to move around, yes, if a chair could enter, understand?* (Subject 14).
Look... anyone can use this cabin, because it's at the bottom, right, on the ferry. Then... it's at the bottom of the ferry, it's easier to get off, to board, to disembark, because if... at the bottom it has one more "priority" for the wheelchair users to be walking, there's no way up there, that one goes up to the top of the cabin, there's no way to get out of the inside, right [...] *Look... the way I am, it's a little difficult inside the cabin because it stays... there are two beds, right, one on the bottom and one and up, then it gets bad for me, it's "moving" to, to... to bed, I have to have help from... when it's my wife's turn, my sister's turn to pull me up.* (Subject 12).
Guiding question: Could the seats on the boats be used by anyone without difficulty?
No, because they have, now they have a wheelchair for the disabled, right? Regret that they don't respect the law, you know? They do not respect the law [...] (Subject 4).
I think that for everyone these seats are no good. Yeah, but we have to go, sis [...] *there's a separation for wheelchair users now* [...] (Subject 7).
Yeah, they're not... it's difficult because for people who are wheelchair users [...] *it's difficult* [...] *it's not appropriate, you know, even people who aren't wheelchair users complain that it's not comfortable.* (Subject 6).
Very uncomfortable. If [the person] *has a problem in the spine, they don't use it, I already have a problem in the bones, I get all sore* [...] (Subject 5).

Source: Field research.

Accessibility of vessel access device

Subject 1 reports that the access device was accessible and could be used without difficulty. However, another 17 participants reported that this device was not accessible and/or was difficult to use, often requiring the participants to need help from third parties, having to go through embarrassing and risky situations, as several needed to be charged in order to be able to use it. get on the boats. Some of the participants stressed

that the access devices were accessible for people without disabilities. In addition, three participants reported that there was no access device on the vessels, further increasing the difficulty.

Acessibility of circulation areas

Regarding the accessibility of the vessels' circulation areas, seven participants stressed that the spaces were good, accessible and that they were able to use them. Participant 2 reported that she had no difficulty getting around on the vessel; however, when asked if other people could circulate without difficulty, she reported that, depending on the situation, these people would have difficulty.

While 12 participants reported that the circulation areas were not accessible and that they could not be used, both structurally and organizationally, two participants stressed that they could not circulate through these areas because, often, there were unorganized personal objects of the vessel's passengers in the space intended for the circulation of people. Two participants reported that, depending on the vessel and its capacity, they were able to move around the circulation areas from the beginning to the end of the vessel.

Accessibility of toilets

Only subject 1 reported that the toilet was good, giving no further details; besides him, five more participants emphasized that the toilets were accessible. Eleven participants reported that the toilets on the boats were not accessible and that, in some cases, they could not reach them, as the circulation area was not favorable, as can be seen in the reports of participants 3 and 5 (Table 2).

Participant 7, when asked if he used the vessel's toilets, stressed that he rarely did so due to his conditions and when asked if he considered them accessible, he exposed his experience, as can be seen in his report in Table 3.

Two participants highlighted that, on some vessels, the toilets are accessible.

Accessibility of cabins

Only five of the 23 participants had the opportunity to travel in the cabins. Three participants highlighted that these spaces on the vessels were not accessible. One participant reported that they were accessible, but stressed that he had to be carried to enter the space. Finally, one participant remarked that they were accessible, as anyone could use them, but also reported difficulty moving around inside the cabin.

Acessibility of seats

Finally, when asked about the accessibility of the boat seats, the participants reported that the seats can be used by anyone without difficulty, and one participant also highlighted that there are specific seats for people with disabilities, but that this is not respected. Another participant also reported that there were spaces on the vessel to be used by people with disabilities, but that, in his perception, the seats were not accessible.

Participant 6 reported that the seats were neither accessible nor appropriate for people with disabilities. In addition, subject 5 reported that the seats were not comfortable and that, depending on the person's condition, they could be harmful.

The other participants only replied that the seats were "good", without exposing further details.

Discussion

Accessibility is related to the basic rights of Brazilian citizens, and its absence can lead to restrictions on opportunities to carry out occupations, leading to deprivation and exclusion. And it is precisely in this scenario that the role of occupational therapy is found, since it supports the fulfillment of these actions in order to guarantee the inclusion and accessibility of individuals, so that they can carry out their occupations and, through them, favor their independence, autonomy and the fulfillment of their occupational roles. Furthermore, when it comes to accessing and using public transport, it is mainly about mobility, described, according to the American Occupational Therapy Association, as an instrumental activity of daily living (Vieira et al., 2015; American Occupational Therapy Association, 2015).

The participants' reports show that numerous occupations are performed during the use of the vessels, and others become possible after the trip. During the journey, some Activities of Daily Living (ADLs), such as using the toilet and performing intimate hygiene in the toilets, resting and sleeping, especially in cases where passengers need to stay on board during the night, need to be performed.

In addition, other occupations are made possible through water transport, that is, users use this transport to reach the state capital and carry out some Instrumental Activities of Daily Living (IADL), such as shopping, working and enjoying leisure time – cited by the participants of this research. However, with the reported difficulties in using this type of transport, it is concluded that there is a restriction on the right to occupation, which is, therefore, an occupational injustice, considering that there is an injury to the right to participate in occupations regardless of physical or sensory conditions (American Occupational Therapy Association, 2015; Castro, 2015).

It is observed that the participants had different understandings about the term accessibility: for example, subject 17 spoke positively about accessibility in the vessel's access devices; however, even in the minority, some participants who highlighted the presence of accessibility on the boats, contradictorily, when asked if anyone could use them, reported that they themselves had difficulties and that, in some cases, other people would not be able to access them.

In the study by Vieira et al. (2015) on the accessibility of public transport in the opinion of people with disabilities, the participants described accessibility in three main axes: as being a right, being able to come and go, and easy locomotion; in addition, these authors presented two excerpts from the responses of two participants, in which one reports that accessibility is the right to walk on the street like a normal person and the other emphasizes that accessibility is a right of people with disabilities, but that often not is observed. Thus, the data from Vieira et al. (2015) corroborate those collected in this research: participants understand accessibility as related to access and locomotion for people with disabilities, although still with some limitations.

The physical barriers were very highlighted by the participants. Another interesting fact found in the data analysis is the organizational level of the vessels, as numerous reports stressed that it is possible to move around when the vessels are empty; however, as the other passengers settle in and accommodate their luggage, or as the company organizes the loads to be transported, it becomes unfeasible to transit the vessel. Thus, it is noted that, although there is a rule that provides for criteria and physical parameters, attitudinal barriers, understood here as the attitudes of society, also undermine the inclusive process of individuals with disabilities (Ponte & Silva, 2015).

Other studies that researched the perception of users to assess the architectural accessibility of some environments corroborate that there is little use of urban public spaces by people with disabilities and that public buildings do not meet the minimum conditions established by ABNT NBR 9050/2020 (Associação Brasileira de Normas Técnicas, 2020), which, in turn, proves the gap between the validity of laws and regulations and their application in the renovation and construction of spaces and buildings (Nogueira, 2017; Pereira, 2019; Alves, 2015; Machado & Lima, 2015; Klein & Grigoletti, 2021; Cunha, 2019). This gap was also found in this research, where no evaluated vessel was completely in compliance with accessibility standards.

Different studies (Machado & Lima, 2015; Alves, 2015; Vieira et al., 2015) investigated users' perception of the accessibility of urban public transport (none was waterway). Varied perception was observed, but all pointed to the fact that accessibility in these transports is flawed and needs adjustments. Studies also point out that the analysis of the perception of users with disabilities leads to a better understanding of their needs. This was also demonstrated in the qualitative data of this research through the reports of the participants, who declared difficulty in accessing the vessel (some needed to be carried), mobility inside it (they could not circulate), in the use of the toilets (they were not considered accessible and there were also difficulties in reaching them), as well as limitations in the choice of environments (cabins were not considered accessible), among others.

None of the evaluated vessels achieved 100% of the checklist items based on the parameters set out in ABNT NBR 15450:2006 (Associação Brasileira de Normas Técnicas, 2006), and when there was an item that agreed with the norm, the rest did not come close to what is expected. Corroborating this fact, most participants reported difficulties in accessing and/or transiting through the vessels. Therefore, the data obtained in this study are worrying, as people with disabilities in the Marajó Archipelago, most of the time, need to move, whether in search of health, leisure or work, like the participants of this study.

The difficulty in using boats limits mobility and, consequently, accessibility and quality of life, given that these guarantee the individual's autonomy (Araújo et al., 2011). However, it is worth remembering that only a part of these vessels was evaluated, which does not indicate that all vessels on the Ilha de Marajó are not accessible. It is important to highlight that, during the execution of this research, the state of Pará approved the Bill (PL) 24/2021, which provides that waterway transport must be adapted for access by people with disabilities and reduced mobility - a breakthrough in legislation and an increase in accessibility expectations on vessels that transfer to Ilha de Marajó.

Final Considerations

The purpose of analyzing the accessibility of vessels that transfer from the capital of the State of Pará to the municipalities of Ilha de Marajó through both physical analysis and the perception of people with disabilities who use this type of transport was achieved, observing agreement among the collected data.

Although there is a specific standard [ABNT NBR 15450:2006; Associação Brasileira de Normas Técnicas (2006)] that describes the parameters and criteria that must be observed within waterway transport in order to guarantee accessibility for passengers with disabilities, few items were in compliance with this standard. When there were accessibility indicators, there were barriers or inadequate installations of the proposed equipment, which nullified the lack of accessibility. It was found that most of the participants were aware and stressed the lack of accessibility on the boats.

The analysis of the vessels and the reports of the participants demonstrate that the accessibility on the vessels of the Ilha de Marajó is not enough for people who have some type of disability, depriving them of the basic right to come and go and limiting their autonomy and independence, since, due to the characteristics of the region, this is the main means of transport for this population and, sometimes, the only one between municipalities.

This study advances the discussions on accessibility of public transport by presenting data about boats, since the publications found in the literature address urban transport. However, even with this advance in the discussions, it is evident that only 10 vessels that carry out the transfer from the municipalities of Ilha de Marajó to Belém were evaluated. In addition, it was not possible to interview participants from all the cities that make up the archipelago. In view of this, it is advised that specific studies be carried out to analyze the accessibility of most of the vessels that carry out this transfer, including other modalities, such as the Basic Health Units on the river and vessels that carry out other lines, with the aim of generating an overview of this theme. rich, but little explored.

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Author's Contributions

Iasmim Teles Corrêa was responsible for study design, organization of sources and/or analyses, writing and revision of the text. Kátia Maki Omura was responsible for revision. Glenda Miranda da Paixão was responsible for study design, writing and revision of the text. All authors approved the final version of the text.

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Appendix A. Interview script – perception of people with disabilities about accessibility on vessels on Ilha de Marajó.

1. Sex:
( ) Female ( ) Male
2. Age: _____
3. Scholarity
( ) Illiterate
( ) Literate
( ) Complete primary education
( ) Complete high school
( ) Complete higher education
4. Type of disability:
( ) Physical:
( ) Hearing impairment
( ) Visual impairment
5. Municipality: _____
6. Do you usually travel on vessels to get to Belém?
7. What kind of vessel do you use the most? E.g.: ship, speedboat, ferry, etc.
8. Most times, what makes you travel to the state capital? E.g.: medical appointments, going out for a walk, visiting relatives or friends, etc.
9. When traveling, was the access to the "ramp" to the vessel accessible, that is, anyone could get in and out without difficulties?
10. In areas where people circulate (e.g. corridors), could anyone walk without difficulty?
11. Were the vessel's toilets easily accessible and would anyone be able to use them without difficulty?

- For individuals who use ships and can spend the night on the trip

12. Have you ever had to travel in a cabin?
13. If so, was the vessel's cabin easily accessible and could anyone use it?

- For individuals using aircraft with planes

14. On aircraft, can seats be used by anyone without difficulty?

Appendix B. Checklist – accessibility on vessels on Ilha de Marajó.

Date:
Municipality
Type of vessel
( ) Ship ( ) Speedboat ( ) Ferry ( ) Catamaran

Name of the vessel:

	ACCESS TO VESSEL DECK	YES	NO	N/E*
1	Does the vessel have an access device?			
2	Does the access device has a baluster and protection, such as railings or support fences?			
3	The width of this device is at least 1m?			
4	Is the floor of this access device regular?			
5	Is the floor of this device non-slip?			
6	Is there access to the passenger deck intended for people with disabilities?			
7	Does the access to the deck have a minimum width of 1m?			
8	Are there steps to access the deck?			
9	Between the access point and the passenger deck, is there a space of at least 1.50 x 1.20m?			

*N/E = not evaluated.

	CIRCULATION AREAS	YES	PARTIALLY	NO
1	Is the width of areas intended for passenger circulation between 1.20 and 1.80m?			
2	In the circulation area, is it necessary to overcome any type of obstacle?			
3	If it is necessary to transpose an object, is the width between them at least 0.90m?			

	TOILETS	YES	NO	N/E*
1	Is there accessible toilet signage?			
	Is the width of the door at least 0.90m?			
2	Are there isolated accessible toilets?			
3	Is there an emergency signaling device?			
4	Are there grab bars in the toilet?			
5	Does the floor have a regular, firm, stable, and non-slip surface?			
6	The space between the toilet and the wall/door is at least 1.20m?			
7	Are there grab bars behind and on the side of the toilet?			
8	Is the lenght of the bars at least 0.80m?			
9	Is the height of the bars from the floor at least 0.75m?			
10	Is the height of the toilets between 0.43 and 0.45m?			
11	Is the discharge drive height 1m?			
12	Is the height of the washbasins between 0.78 and 0.80 from the floor?			
13	Are the faucets in the washbasins operated by a lever, electronic sensor or equivalent device?			
14	Are there grab bars next to the sink?			
15	Is the height of these grab bars the same as the washbasin?			

*N/E = not evaluated.

Vessels that have a long journey (with overnight stay on board)

	DECK	YES	NO	N/E*
1	Is there an accessible cabin on the vessel?			
2	Is the cabin available to people with disabilities located on the main deck of the vessel?			
3	If the cabin made available to people with disabilities is on an upper deck, is access via a vertical lift platform?			
4	Are there any gaps/steps between the deck circulation area and inside the cabin?			
5	Does the circulation area inside the cabin have a minimum of 0.90 and a maximum of 1.80m?			
6	Is the height of the bed approximately 0.50 m?			
7	Are there grab bars?			
8	Is the height of the door handle a minimum of 0.80m and a maximum of 1m?			
9	Is the height of the switches a minimum of 0.60 and a maximum of 1m?			
10	Is the height of the sockets at least 0.40 m and at most 1m?			

*N/E = not evaluated.

Of short-haul voyage vessels using seats

	PASSENGER DECK	YES	NO	N/E*
1	Are there at least two reserved and identified areas for passengers with a wheelchair?			
2	If there are these reserved areas, do they measure 0.80 x 1.20 m?			
3	Are there at least four preferred seats on the vessel?			
4	Do preferred seats have retractable armsrests?			

*N/E = not evaluated.