



ASSISTIVE TECHNOLOGY: REASONS THAT TRIGGER ITS USE AND NON USE

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ARTICLE INFO

Article History:

Received 11th March, 2018
Received in revised form
27th April, 2018
Accepted 09th May, 2018
Published online 28th June, 2018

Key Words:

Assistive technology,
Physiotherapy,
Comprehensive health care,
Wheelchairs.

ABSTRACT

Assistive technology is defined as a set of features, devices and services that provide or extend functional abilities, its main objective being to provide independence, quality of life and social inclusion. This study aimed to understand the reasons that trigger the use and nonuse of assistive technologies with physical disabilities. This is a qualitative study with an intentional sample of 10 participants, all of them being users of assistive technology and the Physiotherapy Clinic. For purposes of data collection, a semi-structured script was used and the interviews were recorded and later transcribed and analyzed according to Bardin's perspective. The results revealed that the reasons for wheelchair use are associated with greater functional independence, although the reasons for not using are related to the lack of urban and residential accessibility, the injuries caused by their use and the need for assistance by the user. It was concluded that the functional independence of the use of the wheelchair is reported by its users, justifying that its use facilitates mobility and helps them to participate in activities, although many wheelchairs do not allow functionality, need assistance from third parties and do not provide much comfort routinely.

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Citation: Pyetra Prestes Negretti, Carla Santos Grosskopf, Fabiola Hermes Chesani and João Pedro Euriques, 2018. "Assistive technology: reasons that trigger its use and non use", *International Journal of Development Research*, 8, (06), 20805-20811.

INTRODUCTION

According to IBGE (2010), it is estimated that 23,9% of the national population in Brazil has at least one of the disabilities included in the census, among visual, auditory, motor and mental disability. It is also concluded that 7% of the Brazilian population has some kind of motor disability. SUS/MS published a report based on a research made in 2012 stating that 71% of the participants who were interviewed use some kind of orthosis, and 38,8% of them are wheelchair users. Assistive technology (AT) is a term used to define a set of resources, devices and services that provide or/and magnify functional abilities, aiming to provide greater independence, quality of life and social inclusion to their users through the use of a better communication, locomotion, skills and participation in society and family (CAVALCANTE *et al.*, 2015). The use of AT can both serve to increase power and autonomy to its users, having an effect on inequality and social

marginalization, as well as to reinforce inclusive practices, solidarity, and social inclusion, considering the difference as an expression of life and human singularity. Conte, Ourique e Basegio (2017) state that, through this perspective, the ATs can expand the possibilities of autonomy and social interaction, enhancing participation in society as a fundamental right of any human being. According to Marcelino e Pilon (2016), even though it seems simple, the process of choosing an equipment of assistance that provides conditions to improve the performance and execution of a daily activity can be extremely difficult. All needs and difficulties faced by the user have to be taken into consideration, all along with the conditions of the environment and the family or possible caregiver. Altogether, these factors define whether the AT will be actually effective and successful or not. Da Costa *et al* (2015) describe that there are several factors interconnected that lead to giving up on the use of the AT, such as overweight, uncomfortable design, function, mobility and access limitations and transportation issues. In addition to an interdisciplinary approach, the professional must analyze the user of an assistive technology from different points of view,

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making necessary the accompaniment for training with the AT, as well as orientation for the use of it and the participation of the user in the process of choosing and prescribing the most suitable device. The responsible professional also has to consider an AT that will not cause any pain, discomfort or dissatisfaction that might lead to an eventual abandonment of the device. The restrictions that wheelchair users face towards their mobility and independence prevent them from exercising their citizenship and right, as well as their self-care. Locomotion is limited as the result of the improper structure of the users' houses, public spaces, and health service facilities, making access to leisure and social participation difficult, requiring special care and burdening the caregiver (VEIGA, 2016). The advantages of using the ATs can be seen in many studies and researches and all of them show the importance of using these devices as an aid to disabled people for the execution of daily activities. However, it is noticed the necessity of investigating the reasons that trigger the use of assistive technology or not by people who have any kind of physical disability. Therefore, this study aims to understand these reasons.

MATERIALS AND METHODS

This is a qualitative research with an exploratory approach, aiming to stimulate the interviewed participants to think and discuss freely about any proposed theme, object or concept.

The participants of this research were part of an intentional group, being them physically disabled people who use any kind of assistive technology and who attend Physiotherapy Clinic and also CER II (Specialized Center of Physical and Intellectual Rehabilitation). The criteria used to be included in this group was: being physically disabled, being a user of assistive technology and being a user Physiotherapy Clinic and CERII services. The criteria used to be excluded from the group of participants was: not being willing to participate, being younger than 18 years old and having any kind of deficit of communication or any difficulty that would prevent the participant to answer any questions of the script. To collect all the data, a semi-structured individual interview script was used with physically disabled people who use AT. This interview was previously structured, yet the questions allowed the participants to expose their opinions and ideas freely. The questions were about how the participant acquired his or her device, the time of use, the adaptation process, the difficulties he or she faces using it, social and family participation, among others.

The interviews were held at Physiotherapy Clinic, scheduled according to an agreement with the responsible professor and in a room where only the participant and the interviewer were. The interviews were recorded, only audio, and later transcribed. The data collection only began after the project had been submitted and approved by the Committee of Ethics and Research of the University, by the ordinance n° 2.015.431, and it followed the ethic principles demanded by the Resolution n° 466/12. Subsequently, the Coordinator of the Physiotherapy Program/School and the responsible for CER II were contacted and authorized the research. The interviews were only started after the participant accepted being part of it and signed a Consent Form (TCLE). To ensure the anonymity of the participants received these color codes. After the data was collected, it was analyzed through the transcription of the interviews and under Bardin's perspective, following three stages of analysis: pre-analysis, analytical description, and

interpretation of the references. During pre-analysis, the interview transcriptions were quickly read, just going over the main ideas. During the analytical description, all the content of the interview was put into categories so that it was more clear to define and understand the reasons that stimulate the use of assistive technology or the reasons that do not stimulate it. Therefore, at this stage, the classification and combination of the data into theoretical or empirical categories were carried out. During the interpretation stage, the discussion of the results starts to be enticed. The discussion starts from a synthesis of each category and expresses the set of meanings present in the different units of analysis included in each of them.

RESULTS AND DISCUSSION

A total of 10 wheelchair users participated in the research and among them, 6 of them were women (60%) and 4 of them were men (40%). Regarding the age, the average age of wheelchair users interviewees was 38,3 years old, being the youngest 19 years old and the oldest 63 years old. The participants presented different clinical diagnostics, however, three of them presented the same diagnosis of spinal injury and two having the same injury etiology: car accident. When asked about how they acquired their current wheelchairs, 4 interviewees (40%) reported having bought the wheelchair, while the other six interviewees (60%) reported they have won it. After several thorough readings of the transcriptions, the results were split into three big categories which present the reasons that trigger the use or not use of the wheelchairs. Next, these categories are going to be presented along with the discussion.

Reasons that trigger the use of the wheelchair

Functional Independence: The wheelchair, under the participants' perspective, provides them a greater mobility, access to leisure activities, sports, thus making the users more independent. It's possible to observe that on their lines:

"Of course it (the wheelchair) helps me, for me to get out of the bed I need the wheelchair, for me to get outside, be on the sun for a while, I need the wheelchair. Sometimes I go out with him (son) to go around a little bit." (blue)

"It (the wheelchair) helps me. Comparing to the time I was able to walk, it really bothers me, but comparing to when I couldn't walk anymore, it helps me a lot, it allows me to move around." (red)

"I took part in all kinds of modalities (...) If there was a group of people playing bocha (a ball game), I would play bocha; if there was a group taking part in track and field, I would take part in it. I played bocha, I did track and field: shot put, javelin throw and hammer. I was a handball player, a basketball player, and for all of these things I used the wheelchair! Because it was my way of transportation and to move, and it was the easiest." (yellow)

Another fact that should be also taken into consideration is that different daily necessities keep showing up and challenging a disable person, so, no matter how efficient and supportive are the health programs and assistance services, it is expected from these people to step up and overcome their challenges and difficulties on their own and through their own effort and

willingness, many times not supported or supervised by rehabilitation professionals. (RIBERTO, 2016). It is important to consider all kinds of functional independence. Sports, for instance, that can be used for many purposes, providing independence and more autonomy to do daily activities, decreasing physiotherapy time, body-fat percentage, contributing to building a new and healthier lifestyle and habits, increasing their self-esteem and being an important factor in favor of overcoming the trauma caused by the injury (Farah; Silva, 2017).

Use orientation

While doing daily activities, the proper way of using the wheelchair can help patient's mobility, making it easier. However, for this to happen the patients need orientation on how to use the wheelchairs as soon as they start using them, and we can observe through their lines from the interviews that this is not a reality. The patients receive orientations only when they are sent to a specialized service of physical rehabilitation:

"No doctor ever gave me any kind of orientation, I used to do things as I saw fit or how I thought it was correct. But at SARAH, they taught me everything I know about doing the transfers, different ways to do them, what I can use as support, how to sit, what to do in case of falling, the tools we can use, like the board, the handles. But the most useful orientation was on how to transfer from the bed to the wheelchair, from the wheelchair to the car, from the wheelchair to the toilet" (green).

"The only orientation I had was given by the physiotherapist for me to do my first transfers, to move from the bed to the chair, from the chair to the bed, to get up. But all the other things about using and handling the wheelchair I learned day by day using it, and mostly because of the sport, my teammates instructed and taught me a lot of things, like how to move, use the arms and not get so tired, and many other things" (orange).
"My husband taught me, he has been a wheelchair patient before me, so he already knew everything. Then, in the beginning, I thought "Oh my God, how am I going to be able to move?", but it's nothing now, with time I learn and figure things out" (purple).

The physiotherapist and the occupational therapist can diagnose architectural barriers that the patients may face at home and instruct them about standard measures and simple low-cost adaptations that can be made so that the environment where the patient lives can provide him/her independence. The professionals' orientations can also concern the patients' self-care, hygiene, the process of getting dressed and locomotion, doing all these tasks with least struggle possible for themselves and for the caregiver, which develops the patients' own potentials (Garanhani *et al*, 2016). Rossi (2016) points out that SARAH service network is a non-state public net of services, that aims to provide medical assistance and qualified and free rehabilitation to all the levels of Brazil's population, as well as developing educational, prevention and research activities in the healthcare field, cooperating with the public system. SARAH network units are interconnected by distance communication technology. Arruda, Moreira e Aragão (2014) observed that the process of sharing and interchanging experiences among patients provides their growth because it made possible to discover ways to overcome personal

difficulties and limitations. Limitations, these, which can make the individual susceptible to situations of submission and accommodation before their life history and make them passive to the processes of exclusion, to which users and families in the community in which they are inserted are exposed. Ossada *et al* (2016) presented that people with spinal cord injury, in its majority, stop using their first wheelchair owing to the fact that it is not adequate enough for locomotion. When the wheelchair is properly prescribed and its use is appropriately trained and instructed by any rehabilitation service or physical therapy professional, it becomes a useful device for beyond just locomotion, avoiding the unnecessary acquisition of wrong assistive technology. When that happens, the wheelchair boosts functional independence, mainly for transfers and handling. The conquest of mobility, even if it's on wheels, facilitates the reorganization of basic functional activities or even more complex ones.

Reasons not to use the wheelchair

Lack of urban accessibility: It is necessary, only, to go out on the streets, in front of our houses, to observe the lack of infrastructure and maintenance of transportation services and lack of accessibility. For wheelchair users, these factors are experiences day by day, on a broader scale. We can observe that in their lines, when they shared, during the interview, the difficulties they face upon urban spaces:

"It bothers me, the problem about the accessibility on the streets. This is the only and big problem. Because it does not only happen on the street, but also in places like here [...] and the worst is when we have to take the bus, because we have to call them, ask them the schedule for the adapted bus and hope for the wheelchair elevator/ramp to be working" (red).

"Brazil, itself, is not meant for physically disabled people. Someone who is deaf can walk around the streets of Brazil, despite the traffic issues; so can a blind person, but for us, wheelchair users, it is too complicated. For example, in Camboriú, the streets and sidewalks are made of parallelepipeds and it is awful to ride on that in a wheelchair. And since my grandfather is who takes care of me most of the time and is available for me most of the time and he cannot have this kind of struggle, since his advanced age, I end up having to stay at home because I can't access some places. But to the places I can go or I have to go, I ride my wheelchair" (black).

"Oh, when I go to different places and there are steps because there usually are steps to go in places like restaurants, it is a little annoying. But it is annoying anyway, because the tables at these places, restaurants, pubs, are not suitable to the wheelchair, they are either too high, reaching up to my chin, or too low so the wheelchair does not fit under them. It's hard to go to a place where the tables and the wheelchair fit" (orange).

The lack of periodic maintenance impedes physically disabled people to access public places or transportation. Drivers' and other employees' training and preparation to receive and serve physically disabled costumers need to be reinforced and improved, being fundamental to find different ways and measures to ensure a more humanized service, better quality and a service that provides independence to all customers (Santarpio; Cavalcante; Alves, 2015). Although the lack of

accessibility is shown related to a specific type of disability, the visual, it is known that the same limitations occur to people with other types of disabilities, physical and others. The images found in Gomes and Garcia's study (2017) denounce, therefore, that the application of public policies of accessibility is not enough to guarantee mobility rights. The cities were definitely not planned and built for any physically disabled person. The analysis made of the urban mobility services in Brazil is able to show that the greatest concern of these services is about the major groups, not the minor ones. Pereira, Barbosa e Júnior (2016) observed through an urban study that there still is a big gap between the proportion of accessible cities and the ones that deal with the lack of essential equipment to ensure accessibility. The study shows that while the ramps for wheelchairs and adequate sidewalks around the homes correspond to 69% and 4.7% respectively, the paving and the construction of street curbs are at 81.7% and 77% respectively.

Lack of home accessibility

Wheelchair users face difficulties to move around their own residence daily, and that is a result of many factors that the interviewees have listed, such as little space to spin the wheelchair around, big pieces of furniture in inadequate places, stairs, and steps, among other things we can identify on their lines:

"Certain places in my house, for example, the main entrance is partially blocked for me because there are some sofas and I can't get rid of them. I can't make everything so easy for me to move around, I have to keep adapting things slowly." (purple)

"I use the wheelchair for about four hours, and I also have the chair to bathe that helps me a lot, but the wheelchair is impractical because my house has narrow hallways and there are always pieces of furniture in the way, and there are also the stairs. So I mostly use the wheelchair when I go out, go traveling or come here for the physical therapy." (black)

"I was cooking some meat and the stove is really high for me, so the oil spilled all over my face. My ex-husband was scared and I told him I've always wanted to adapt the stove for me and he said we would do it, but not everybody can do this. My kitchen, my sink are adapted, but among the wheelchair users from the group I participate only four people have adapted houses, the other ones have to get around with it" (yellow).

Silva e Silva (2015) report that grab rails for disabled people in the bathroom, non-slip flooring, proper lightening, handrails, replacing stairs by ramps, avoiding sharp corners and broadening the doors and hallways are some details and changes that facilitate the needs of the patients. Environment adaptation provides wheelchair users more safety and, subsequently, better life quality. One factor that is determinant for the non-adaptation of the houses and home accessibility deficit is the absence of awareness of the population, which leads to an equivocate care of the wheelchair or AT users. Another aggravating factor is the configuration of the residence, which often implies to the patient not use the wheelchair, creating the need for finding another way to move around. One example is when the patients crawl on the floor or they move leaning on and supporting themselves on the furniture because there isn't enough room to use the wheelchair properly, which is a loss to patients' autonomy (Teixeira; Medola; Paschoarelli, 2015). Mariño, Silveira e De Silva

(2016) show, through their study on ergonomics for wheelchair users wardrobe, that anthropometry and ergonomics bring studies of physical measures of the human body and its relation with work, giving results that guarantee the modifications in the different social spheres, giving autonomy in spaces, furniture and urban equipment, buildings, transportation services and devices, systems and means of communication and information. To this end, it is considered that the proper application of Design practices, associated with its universal principles and the use of anthropometric requirements, allow the development of accessible furniture adapted to the inclusion of all or most people for its use.

Injuries because of the use

The lack of funding for practical and comfortable wheelchair designing is the reason for heavy, inefficient and hard-to-manuever wheelchairs, making their users susceptible to accidents and body injuries, like the interviewees' report:

"I don't always use (the wheelchair). I have back pain and problems, so I have to lay down for a while. I use the wheelchair for about 60% of the time and the other 40% I spend laying down. I have lumbar wear, so it hurts a lot. I have already taken spinal injections for the pain and they helped. Before, even standing still it hurt me, now I only feel pain as I move." (green)

"I have already fallen twice. Once I was going to pick up weeds from my garden and the other time I was going to pick up some lipstick from the floor and ended up breaking my ankle." (white)

"I spend much time laying down. I do the following: I stay from one to three hours on the wheelchair, because I have bedsores and I cannot spend a lot of time sitting. So I usually practice some sports in the morning for about two hours, then, at home, I lay down on my sides or stomach. My mattress is air-driven so that it avoids more eschars." (orange)

According to Silva e Farah (2017), the difficulties encountered by the wheelchair user appear intrinsically, due to his/her physiological limitations related to the trauma and spinal injury: pulmonary ventilation decrease, lack of thermoregulation control, bedsores, urinary and fecal incontinence, loss of sensitivity in some parts of the body. These limitations help the wheelchair users feel apprehensive to leave their house. Therefore, the wheelchair user, in addition to having decreased mobility and other physiological limitations, along with the fact of staying long periods sitting in the same position, contribute to the occurrence of pressure injuries, with major predominance in the aforementioned places. However, there are protocols such as the ones Olkoski and Assis (2016) list, used for the prevention of these injuries, which include: instructing wheelchair users to relieve pressure every 15 minutes, protecting the chair seat with a pressure reducing cushion, keeping postural alignment and controlling weight distribution and stability.

The wheelchair versus heteronomy

Wheelchair users must develop certain abilities with it so that they can achieve independence. However, the fear of falling, lack of practice and physical conditioning do not allow full

independence, creating the need for someone else's help and support, as we can see in their lines:

"Who pushes me around is my mom, my arms are not strong enough to push the wheelchair" (red).

"I ride the wheelchair to the corner of my street, but go around the city, for example, I can't. I need help to go up the ramps because my biggest fear is to fall down. I have gone up the ramps here, for example, but there was always someone behind me. If I have to do it on my own, I can't. I am afraid of falling". (pink)

"I can't do it on my own, my son helps me with everything. I can't even get out of bed, to do so I have to put my hands around his neck and he pulls me out of bed and puts me on the chair." (blue)

"I always need someone to do something for me, I think that my relationship didn't work out because of that. Because, for example, if he was still with me he would have to be the one to put me out of the wheelchair... He used to be more tired than me and he had to work".(yellow)

Ribeiro *et al.* (2014) report that the significant number of traffic and work accidents have contributed to the increase of people with incapacitating sequelae, which prevents them from being independent. In this sense, a dependent person is someone who for a period of time needs help from another person or equipment to perform certain self-care activities. In situations where the dependent does not participate in self-care activities, it is assumed that the care provided by another person is essential. When he or she needs help from another person to carry out the activities, it is assumed that the care provided is only collaborative or partial. Yet, the loss of functional capacity can be so severe that the help from third-parties might be also necessary.

In a study conducted by Boehs *et al* (2016), in the context of self-care and wheelchair use, they found that activities in which more people were dependent and needed personal help included maneuvering in curves, access ramps and other obstacles at slow, moderate or rapid speed (64.9%) and transfers to and from the wheelchair safely (62.1%). 5.4% of the participants needed help just to move the body on the wheelchair, from side to side, while 35,1% were independents for the same task. Another aspect that might contribute to the manifestation and possible maintenance of dependence is the physical and social environment that surrounds the dependent person, as mentioned by Ribeiro *et al* (2014). Physically, the environment can present architectural and ergonomic barriers with a negative impact on the execution of self-care activities, for example. On the other hand, socially, attitudes and behavior of people who are close to the dependent can contribute to the promotion of independence, or, on the contrary, aggravate their dependence. Actually, in some situations, the social environment the patient is inserted intends to ignore his or her capacity, encouraging and reinforcing their manifestations dependence, turning the concept of "helping the person" into "doing for the person".

According to a study done by Boaventura, Borges e Ozaki (2016) about neurological adult patient caregivers and their work overload, nine out of sixteen caregivers reported no overwhelming work or stress, five out of sixteen reported mild to moderate level of overload and stress and two out of sixteen

reported moderate to severe level of overload and stress. There were no caregivers who reported intense stress or overload. Even though the majority of this population did not present a degree of intense overload, fifteen out of these sixteen caregivers could count on patient's relatives and family to help them out when necessary.

Social representations of the wheelchair use

Wheelchair dependence and the functional independence:

The wheelchair should be safe, comfortable and lightweight to optimize its use and allow locomotion independence. In addition to providing a more active and socially participative life so that it results in life quality improvement, as we will see in the following speeches:

"I need it (the wheelchair), today I feel like I depend on it 80% of the time. But I have a normal life, the difference is I have to adapt to it, learn how to live on the wheelchair, but without it, I would not even move, go out". (pink)

"Actually, the wheelchair provides you dependence and also independence, because, at the same time that I depend on it, it gives me my independence". (green)

"If I didn't have my wheelchair, I wouldn't be able to be alone at home when my husband goes to work, I would not be able to do house chores". (orange)

"I hadn't needed a wheelchair until I started not being able to move and started needing someone else to keep holding me and keep me from falling down. As I was growing up, I was getting bigger and bigger, my grandfather - you may have seen him out there waiting for me - is a 78-year-old-man, he is pretty tired. Then I realized the need of a wheelchair, to give me some independence" (black).

The wheelchair should not be seen as a symbol of incapacity but as a mean of locomotion. Adapting to the new condition is difficult and the patient should face that establishing concrete and achievable goals, as well as aiming for his or her autonomy and capacity to self-govern. This is only possible with adequate devices, early and supervised training, as Ossada *et al* (2014) mentioned. Yet, the wheelchair is seen as a two-way street: the patient has some functional independence because of the wheelchair, yet he can not live without it. And so he or she needs both to adapt the chair to his/her life and also his/her life to the chair. The setting of the physical deficiency causes important modifications in someone's life, both physically and emotionally, interfering in his or her routine and in all plans. Finding and building up a meaning for life involves more than giving meaning to it, in involves reorganizing the way the world is seen, including the way oneself and society are seen, since the human being is endowed with the capacity to revise conceptions and interpret events. Vasco and Franco affirm that, as constructing a meaning for loss, mourners are assigned to finding benefits from it and transforming themselves. Finding themselves able to face challenges and overcome situations also depends on family support and physical rehabilitation reliability.

Social and family exclusion when using a wheelchair:

Before the difficulties faced daily by wheelchair users living in an environment with physical, psychological and social barriers, associated with the functional and physiological

needs, we can observe that these factors are primary for their social exclusion:

"I spend most part of my week, month and year at home. Brazil, itself, is not meant for physically disabled people. Someone who is deaf can walk around the streets of Brazil, despite the traffic issues; so can a blind person, but for us, wheelchair users, it is too complicated. For example, in Camboriú, the streets and sidewalks are made of paralelepipedos and it is awful to ride on that in a wheelchair". (black)

"My manicure, for example, lives nearby my house and she doesn't answer me anymore. She said she doesn't want to see me anymore because she can't see me like this, since she was used to seeing me walking before, working, and so on. Since I had the accident she didn't see me anymore and if she did, it was from far away. She doesn't want to paint my nails anymore." (purple)

"In the beginning, I was even ashamed of going out, I was used to walking. So when my son invited me, I'd get very insecure about it, I'd say "how are they going to look at us?". But there's nothing we can do about it. I have faith I will be better." (blue)

Nowadays, wheelchair users are gaining rights that allow them to improve their quality of life, such as: bigger insertion as labor force, public buildings, and roads with better accessibility, accessible means of transportation, among others. However, despite these advances, it is known that the reality is still difficult for them and that they still need many improvements to enhance their quality of life, especially from a psychosocial point of view, as Silva and Farah (2017) mention. According to a study carried out by Lima (2017), 81,25% of wheelchair users would go out when necessary and 18,75% of them would go out daily. 56,25% use public transportation, the remaining (43,75%) do not. It was noticed that 68,75% of wheelchair users circulate on the streets out of their houses, while 18,75% circulate only inside their homes and 12,5% circulate on streets, public squares and other public places. Yet, some architectural barriers commonly encountered are inadequate flooring, uneven surfaces, out-of-standard door dimensions, stairs and problems with ramps, handrails, and bathrooms. Besides that, wheelchair users have problems with urban transportation, because many times the drivers do not even stop for them, since it takes some time to get them accommodated.

Unfortunately, there is a big gap in Brazil in order for mobility and accessibility to be effectively implemented, despite the fact that much has already been done for the benefit of people with special needs, for example, the formalization of laws and criteria of accessibility to the physically handicapped person, such as the ABNT (Brazilian Association of Technical Norms), the accessibility law (Law N°10.098/2000), the parameters of Brazilian Standard NBR-9050, among others. As Sloboja (2014) shows, small changes (mainly architectural) can be very effective in this process such as step signs, construction of disabled access ramps (wheelchairs), wider doors and wide corridors. Those are details that can be unnoticed in the eyes of normal people, but they make all the difference for those who need special care. Silva and Farah (2017) claim that, in order to seek equality of opportunity, the disabled person needs to face the physical world and other

people in their daily lives. The physical world, created by man for the so-called "normal" man, and the environment are also barriers. The other people are those with their customs, values, attitudes and social expectations, which exclude by prejudice, ignorance or devaluation the person with disabilities from their lives. As Vasco and Franco (2016) report, it is indisputable that the presence of the physical disability on people will also affect their family and the people around them. One of the participants in the study stated that they saw others as having difficulty accepting their present condition, and hoping to see him as he was before. At other times, he mentioned being uncomfortable when pejorative connotation was attributed to his disability. Other participants mentioned realizing that people get uneasy when they see physically disabled people well as if they were seeing something that is not possible or they were not expecting - being happy in a wheelchair.

Conclusion

Functional independence when using a wheelchair is brought up by its users regardless of the type of wheelchair they have. The justifications for this assertion are several, such as how easy might be to move at home or in urban environments, to carry out leisure practices and to participate in sports and other activities. However, many wheelchairs do not allow adequate functionality to the user, creating the need of constant help from family members and other people involved in their care, and do not promote comfort in their day-to-day use. Factors, such as those associated with the functional disorders caused by the disability and the use of the wheelchair, cause body discomfort and pain to the patient, as well as making them insecure to use the equipment for long periods or to leave their houses, which leads them to social exclusion. Even when the chair may allow the users to go out to public places, it is necessary to appropriate urban accessibility and there we find a great barrier that is faced daily by the wheelchair users: the cities in Brazil are poorly designed, providing deficient accessibility to this public.

REFERENCES

- Alessandra; A; Cavalcanti, A.L; Santarpio, A.F.R (2015) O direito de ir e vir: a acessibilidade do transporte público/The right to come and go: public transport accessibility. *Cadernos Brasileiros de Terapia Ocupacional*, v. 23, n. 4.
- Assis, G.M; Olkoski, E 2016. Aplicação de medidas de prevenção para úlceras por pressão pela equipe de enfermagem antes e após uma campanha educativa. *Esc. Anna Nery*, Rio de Janeiro, v. 20, n. 2, p. 363-369. Available from <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1414-81452016000200363&lng=en&nrm=iso>. access on 15 Feb. 2018.
- Available from <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342015000100014&lng=en&nrm=iso>. access on 01 Feb. 2018.
- Barbosa, A.C.L; Junior, C.P; Pereira, F.C. 2016. Dos velhos aos novos desafios à acessibilidade em consonância com desenho urbano. *Revista Includere*, v. 2, n. 1.
- Basegio, A.C., Conte, E; Ourique, M.L.H 2017. Tecnologia Assistiva, direitos humanos e educação inclusiva: uma nova sensibilidade. *Educação em Revista*, v. 33, n. 2. p. 28.
- Boehs, A.E; Silva, A.M.F; Rocha, M.D.H.A; Rocha, P.F.A; Mergner, p.g; Patel, j.v 2016. O cuidado da família da criança com paralisia cerebral: revisão integrativa. *Revista*

- de Enfermagem. FW. v. 12, n. 12, p. 64-79. Available from <<http://revistas.fw.uri.br/index.php/revistadeenfermagem/article/view/2254>>. Access on 15 fev. 2018.
- Cavalcante, L.D.W *et al* 2015. Assistive technology for visually impaired women for use of the female condom: a validation study. *Rev. esc. enferm. USP, São Paulo*, v. 49, n. 1, p. 14-21, Feb.
- Censo Demográfico 2010 2012. Características gerais da população, religião e pessoas com deficiência. Rio de Janeiro: IBGE.: Available from <ftp://ftp.ibge.gov.br/Censos/Censo_Demografico_2010/Caracteristicas_Gerais_Religiao_Deficiencia/caracteristicas_religiao_deficiencia>.
- Da Costa, C.R. *et al.* 2015. Dispositivos de tecnologia assistiva: fatores relacionados ao abandono/Assistive technology devices: abandonment related factors. *Cadernos Brasileiros de Terapia Ocupacional*, v. 23, n. 3, p. 17.
- De Silva, R.C; Mariño, S.M; Silveira, C.S. 2016. Antropometria aplicada aodesign de produtos: umestudo de caso de dimensionamento de armário de guardar roupa para cadeirantes. *Blucher Engineering Proceedings*, v. 3, n. 3, p. 292-304.
- Farah, B.Q; Silva, C.E.B 2017. A importância da prática esportiva na qualidade de vida de cadeirantes: uma revisão narrativa. 2017. 14 f. TCC (Graduação) - Curso de Educação Física, Asces-unita, Caruaru.
- Garanhani, M. R. *et al.* 2016. Adaptação da pessoa após acidente vascular encefálico e seu cuidador: ambiente domiciliar, *cadeira de rodas e de banho. Acta fisiátrica*, v. 17, n. 4, p. 164-168.
- Garcia, A.L.C; Gomes, R.B. 2017. A falta de acessibilidade urbana para pessoas com deficiência e suas implicações em saúde mental e garantia de direitos humanos. *Cadernos Brasileiros de Saúde Mental/Brazilian Journal of Mental Health*, v. 9, n. 24, p. 230-253.
- Lima, J.M.M.; Rebouças, J.B.L. 201. Relação entre o Uso da Cadeira de Rodas e a Auto- Infecção: Uma Análise Microbiológica. *Revista Científica Multidisciplinar Núcleo do Conhecimento*. Ano 2, Vol. 1. pp 352-362, Abril de 2017. ISSN: 2448-0959. Available online at <<https://www.nucleodoconhecimento.com.br/wp-content/uploads/artigo-cientifico/pdf/uso-da-cadeira-de-rodas.pdf>>. Access em 15 fev. 2018.
- Marcelino, A.M.; Pilon, J.H. 2016. Artefato robótico e dispositivo móvel para a movimentação da cadeira de rodas motorizada. 65 f. TCC (Graduação) - Curso de Tecnologias da Informação e Comunicação, Universidade Federal de Santa Catarina, Araranguá. Available online at <<https://repositorio.ufsc.br/xmlui/bitstream/handle/123456789/165339/TCC-Adriano-e-JaimeHenrique.pdf?sequence=1&isAllowed=y>>. Access em: 29 jan. 2018.
- Medola, F.O.; Paschoarelli, L.C.. Teixeira, L.C. 2015. A pessoacom mobilidade reduzida no ambiente domiciliar: demandas para o design universal e tecnologia assistiva. *Blucher Design Proceedings*, v. 2, n. 1, p. 391-399.
- Moreira, A.C.A.; Aragão, A.E.A.; Arruda, L.P. 2014. Promoção da saúde: atribuições do enfermeiro como educador na estratégia saúde da família. *Essentia-Revista de Cultura, Ciência e Tecnologia da UVA*, v. 16, n. 1. Available online at <<http://www.uvanet.br/essentia/index.php/revistaessentia/article/view/10>>. Access em 15 fev. 2018.
- Ozaki, A.H.; Borges, H.C.; Boaventura, L.C. 2016. Avaliação da sobrecarga do cuidador de pacientes neurológicos cadeirantes adultos. *Ciência & Saúde Coletiva [online]*. v. 21, n. 10 [Acess 15 Fevereiro 2018], pp. 3193-3202. Available online at <<https://doi.org/10.1590/1413-812320152110.15202016>>. ISSN 1678-4561. <https://doi.org/10.1590/1413-812320152110.15202016>.
- Pinto, C.A.S.; Regadas, S.C.R.S.; Ribeiro, O.M.P.L. 2014. A pessoa dependente no autocuidado: implicações para a Enfermagem. *Rev. Enf. Ref., Coimbra*, v. serIV, n. 1, p. 25-36. Available online at <http://www.scielo.mec.pt/scielo.php?script=sci_arttext&pid=S0874-02832014000100004&lng=pt&nrm=iso>. access em 15 fev. 2018. <http://dx.doi.org/10.12707/RIII12162>.
- Riberto, M *et al.* 2016. Independência funcional de pacientes com lesão medular. *Acta fisiátrica*, v. 12, n. 2, p. 61-66.
- Rossi, L.S.P.A. 2016. Interação social e neuroreabilitação de adolescentes com lesão cerebral: umestudoexploratórioemtorno da rede social 5dnet da reed Sarah de hospitais de reabilitação / Luciana de Souza Pinto Alvarenga Rossi; orientador Gilberto Lacerda Santos. -- Brasília. 322 p.
- Silva, J.L.; Silva, R.S. 2015. Sustentabilidade: Casa contendo sustentabilidade hídrica e energética com acessibilidade para cadeirantes. 36 f. TCC (Graduação) - Curso de Engenharia de Produção, Faculdade de Pindamonhangaba, Pindamonhangaba.
- Sloboja, R. 2014. A acessibilidade e a inclusão social de deficientes físicos (cadeirantes) nas escolas público-estaduais de goioerê: superando as barreiras na educação. 2014. Monografia (especialização em Ciências) - Universidade Tecnológica Federal do Paraná – UTFPR, Goioerê. Disponível em <http://repositorio.roca.utfpr.edu.br/jspui/bitstream/1/4186/1/MD_ENSCIE_IV_2014_86.pdf>. Access em 15 de fev. 2018.
- Vasco, CC.; Franco, MHP 2016. Paraplégicos e o significado para a lesão medular. *Psicologia: Ciência e Profissão*, 37(1): 119-131. Available online at <<http://www.scielo.br/pdf/pcp/v37n1/1982-3703-pcp-37-1-0119.pdf>>. Acesso em 15 fev. 2018.
- Veiga, A.I. 2016. Avaliação da postura corporal de cuidadores de indivíduos com locomoção totalmente dependente de cadeira de rodas, por meio da biofotogrametria computadorizada e cif. 52 f. TCC (Graduação) - Curso de Fisioterapia, Centro Universitário de Formiga - Uniformg, Formiga - Mg. Available online at: <https://bibliotecadigital.uniformg.edu.br:21015/xmlui/bitstream/handle/123456789/416/TCC_AnaIzabelVeiga.pdf?sequence=1&isAllowed=y>. Access em: 30 jan. 2018