

Análise do ambiente de supermercado para idosos: um estudo de caso.

ANALYSIS OF THE SUPERMARKET ENVIRONMENT FOR THE ELDERLY: A CASE STUDY

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Resumo

A intenção deste artigo é analisar o ambiente do supermercado, com o objetivo de listar os problemas experienciados pelo público idoso, sob aspectos cognitivos, interações físicas e serviços ofertados pela loja. Através de um referencial teórico sobre o público idoso, o ambiente dos supermercados e a acessibilidade, foi realizado um estudo de caso, no qual foram observadas três mulheres idosas enquanto realizavam suas compras. Os resultados mostraram que o ambiente não possui tecnologias assistivas, nem auxílio aos idosos em suas compras, além de alguns setores não serem devidamente acessíveis. Espera-se com esta pesquisa consolidar o conhecimento sobre o tema, e prestar atenção especial para este público em crescimento que precisa de maior atenção.

Palavras-chave: Fatores humanos; design de interiores; supermercado; idoso; acessibilidade.

Abstract

The aim of this article is to analyze the supermarket's entourage, with the goal of listing the problems experienced by the elderly public, under cognitive aspects, physical interactions and services offered by the store. Through a theoretical referential about the elderly public, the supermarkets' environment and accessibility, a case study was carried out, in which three elderly women were observed while they were shopping. The results showed that the environment does not have assistive technologies, nor does it help the elderly in their purchases, in addition to some sectors that are not properly accessible. This research is expected to consolidate knowledge about the subject, and pay special attention for this growing public that needs more care.

Key-words: Human factors; interior design; supermarket; elderly; accessibility.

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1 Introduction

Since the increase of longevity, the elderly public has been the focus of many researches involving human factors, in order to improve their functional well-being, autonomy and security. The understanding of interactions between human beings and other system elements are the contribution of ergonomics. Following these principles, this article seeks to comprehend the elderly's needs and provide solutions that could contribute to their life's quality. The analysis of existing possibilities and alternatives for this public is fundamental to understand the current society.

Thus, this article integrates ergonomic studies of interior design in order to analyse the elderly consumers interactions in commercial physical spaces, such as the case of supermarkets, which is a common living space to this public, where they can interact and buy self-care supplies. Therefore, the aim of this article is to analyze the supermarket's entourage, with the objective of listing problems experienced by this public, under cognitive aspects, physical interactions and services offered by the store.

Nowadays, supermarkets provide an incredible range of supplies, such as food, hygiene products and cleaning, among several others. Hence, it is a recurring place for seniors who seek to meet their basic needs. This study has investigated the interaction with the supermarket environment and identified the difficulties encountered by this public, related to ergonomic issues.

The problems in the interaction of the elderly user with the supermarket environment can be cited and classified into three categories: organization and layout of the supermarket; accessibility of products on shelves and interface devices (barcode scanners, cartons); and reading information about products and prices. "The layout needs to be presented in a clear, brief, precise, organized, pleasant and efficient way to the consumer, stimulating the purchase"(FADIGATTI et al., 2015, p.7).

The research carries on a bibliographic survey about elderly users, including accessibility and assistive technologies, as well as understanding the elderly's specific needs in the supermarket environment. The methodology consists in observations and interviews of a control group. By accompanying them to a shopping experience in the supermarket, several difficulties were spotted, which clearly turned nontrivial such a basic and important activity.

These difficulties are often overlooked by the supermarket stores, but with the elderly population growing worldwide, with active consumers with financial resources, the knowledge of the difficulties and the design of spaces for this public has a paramount importance, generating independence and quality of life for the elderly population.

Population ageing is about to become one of the most significant social transformations of the twenty-first century, with implications for near-

ly all sectors of society, “including labour and financial markets, the demand for goods and services, such as housing, transportation and social protection, as well as family structures and intergenerational ties” (UNITED NATIONS, 2015, p.1).

1.1 Elderly

Aging is a worldwide phenomenon and its effects are perceived in social demands. Demographic data from the Brazilian Institute of Geography and Statistics (IBGE,2016) indicates that the number of brazilians over 60 years old in 2016 was 12.10% of the population, of which 6.75% are women, and 5.35% are men. It is estimated that by 2030, this public will represent 18.62% of the population, being 10.31% women and 8.31% men, as shown in Figure 1.

“The real potential of this consumer public in Brazil, due to increased life expectancy and economic rise in the country, reveals the need to develop greater attention on this population” (DEMILIS; REIS, 2016, p. 57).

Many older people remain in good physical condition, perform daily tasks independently, and are potential consumers for various market segments. They represent a significant portion of the population that is increasingly inserting itself into society, requesting that the services and products offered also privilege their perceptive characteristics, since they are potential users of social and cultural spaces.

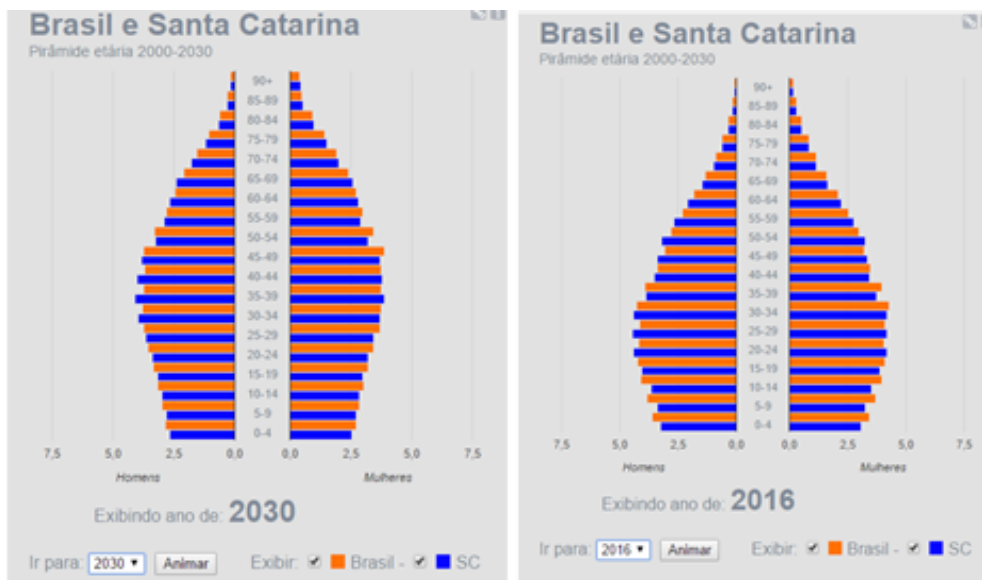


Figure 1 - Age Pyramid
Source: IBGE (2016)

However, the specific and functional needs of this public are considerably different when related to adults in the following areas: cognition, perception, motor control and motivation.

The elderly are complex users, since each physiological modification can cau-

se a different limitation in the use of space and equipment. For example, an elderly person with visual problems has difficulty in orientation and localization, as well as having a slower reaction time than the average elderly (ELY; DORNELES, 2006).

Another issue that could be commented is the lack of physical conditioning in the elderly. In one experiment that consisted of the reach range for higher shelves on a kitchen, the elderly had a limitation of amplitude, measured in degrees, of up to 10% relative to the youth group, as shown in Figure 2.



Figure 2 - Maximum range in degrees

Source: BOSSE (2013)

1.2 Assistive Technologies

Science and technology are increasingly embedded in people's lives. With the aim of including those who have some kind of disability, assistive technology provides devices, services, and strategies to provide greater autonomy and quality of life. Therefore, it should be understood as an aid that will either promote the expansion on a functional ability or enable the achievement of such function, which is in general prevented by circumstances of deficiency or aging. The goal of assistive technology is to provide greater independence, quality of life and social inclusion for people (BERSCH, 2013).

1.3 Accessibility

The term *accessibility* is defined by the Brazilian Association of Technical Norms as the possibility and condition of reach, perception and understanding the use with security and autonomy of: spaces, furniture, urban equipment, buildings, transport, information and communication. Also included, are systems and technologies as well as other services and facilities open to the public by persons with disabilities or reduced mobility. The normative NBR 9050 (ABNT, 2004) aims to provide the autonomous and safe use of spaces, regardless of age, height, limitation of mobility or perception.

The accessible route is a continuous, clear and signaled route that connects the external and internal environments of spaces and buildings, and can be used in

an autonomous and safe way by all people. In order to make spaces accessible, four components of accessibility should be taken into account: orientation / information, displacement, use and communication, identified by Dischinger and Bins Ely (2006).

As for orientation and information, environments should be spatially comprehensible and present different forms of information to guide the person, such as boards, maps, sound signaling, among others. The use of different colors and contrast should be used in areas for the elderly, as they facilitate the perception of spaces and can prevent accidents. As for the displacement, the care with the types of floors is important, since they must be non-slip and anti-reflective, to avoid falls and glare, respectively (ELY, DORNELES, 2006)

As for communication, it corresponds to the skill of interaction between users with the surroundings, and can be guaranteed from spatial configurations or assistive technologies. In very large spaces with many functions and possibilities of activities, the implementation of information desks and computerized terminals, especially for people with hearing and linguistic problems is suggested.

Another important issue to be pointed out is that indoors social environments, such as supermarkets, should provide comfort and safety to people with visual problems, which in some environments suffer from excessive brightness, poor lighting, low contrast, among other problems.

Fresteiro (2005) states that lighting is a space-defining element, always guided by norms, but these are almost always elaborated "for the needs of people with normal vision or without mobility problems, and it is rarely used correctly to signal the obstacles that the spaces present " (FRESTEITO, 2005, p. 191).

2. Methodological Procedures

The methodological procedures consists in an observation of a control group of three elderly women, who were volunteers, as an initial exploratory experiment. They were observed individually during shopping experience, when inserted in the physical space of a specific supermarket in the city of Florianópolis, Brazil.

The selected store belongs to a chain of supermarkets, with international coverage, located inside a shopping mall in the central part of the city. It is an environment with an average size of 7,500m², with about 65 thousand items, including food, electronics, textiles, utilities, household goods, toys, stationery, pets, cleaning and gardening products and convenience services.

An observation script was carried out to identify points to be given attention, but without influencing at any moment the choices and actions of those observed. After the observation, this information was transcribed and organized in the form of tables for better analysis and description.

2.1 The Case Study

The case study in question addressed human factors and physical ergonomics, inserted within the commercial environment of a supermarket, having as volunteers three elderly women with 66, 71 and 75 years old, with diverse profiles in relation to

health, behavior and daily habits. Their behavior and physical interaction with the environment was observed, from a technical point of view. The observation was then organized in stages that allowed the occurrence of situations that triggered some specific behaviors in the interaction with their respective activities. This case study was divided in three different stages: basic participant data collection, open interview and observation script, as shown in the diagram below.

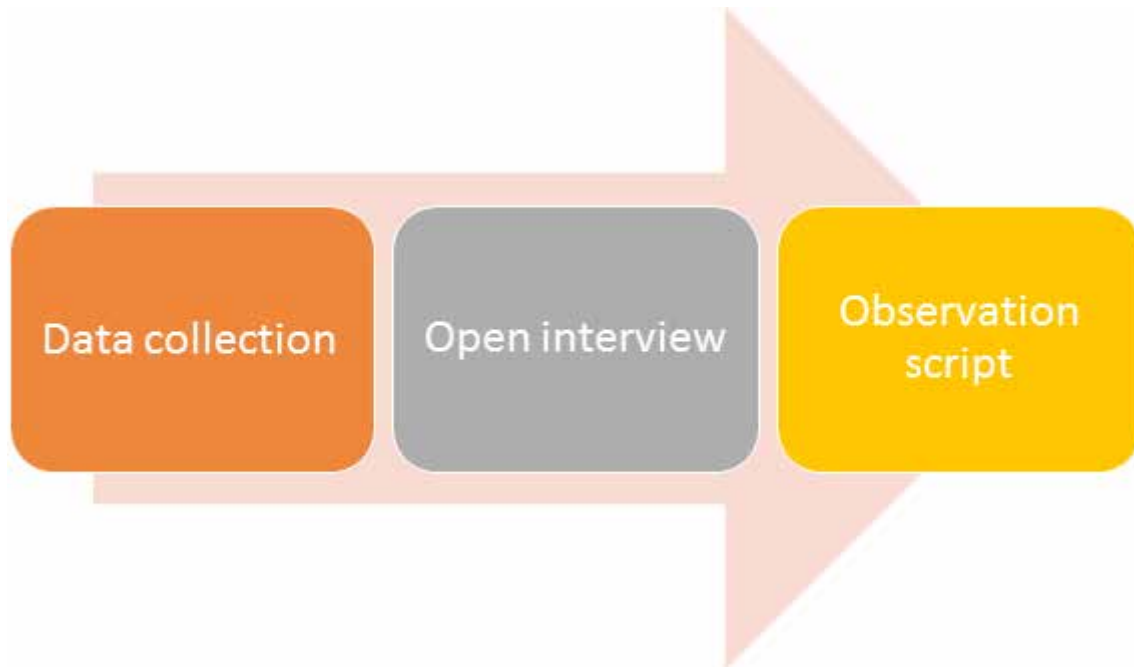


Diagram 1 - Methodological Procedures

Source: The authors (2017)

It started with a socio-demographic data: name, age, sex, previous and current occupation, and marital status of the observed participants. The next informations were address, health, self perception about their condition, the frequency of visits to the supermarket, and whether they go alone or with company to these visits. Moreover, informations about the environment of the supermarket itself were gathered and experienced situations where they encountered difficulties were related. Finally, they shared suggestions for change or improvements in the supermarket environment.

The observer collected and annotated the comments and perceived behaviors in order to obtain information with greater assertiveness from the observed participants. The interview was formalized at the end of the observation, which allowed the participants to expose specifically and punctually what bothered them the most.

The observation script was subdivided in three items that took into account the participant's cognition and perception aspects, their physical interactions with the environment, and the services offered to the elderly public by the supermarket chosen for this study. The times of start and finish of the activities were recorded in order to analyze the relationship between the time spent by each participant and the performance of the activity.

In order to observe the cognitive aspects of the participant, a series of possible behaviors expected during the course of the activity were listed; factors such as

cordiality, interest and productivity during activity, signs of tension, fatigue, hostility, insecurity and frustration were taken into account during the observation.

However, mainly aspects related to thinking, perception, memory, reasoning and communication were punctuated during the activity, in order to understand how the observed participants have the activity of shopping affected by the state in which their respective cognitive conditions were found. In this stage, were also analyzed the decisions of each participant considering the influence of their cognitive condition.

Decisions such as seeking help from employees to find a product, the feeling of disorientation, the attitude of eliminating the task, and also about physical fatigue, influencing the decision to stay in the facility and look for somewhere to rest or even rushing their tasks to be able to leave the supermarket were taken into consideration for a detailed observation.

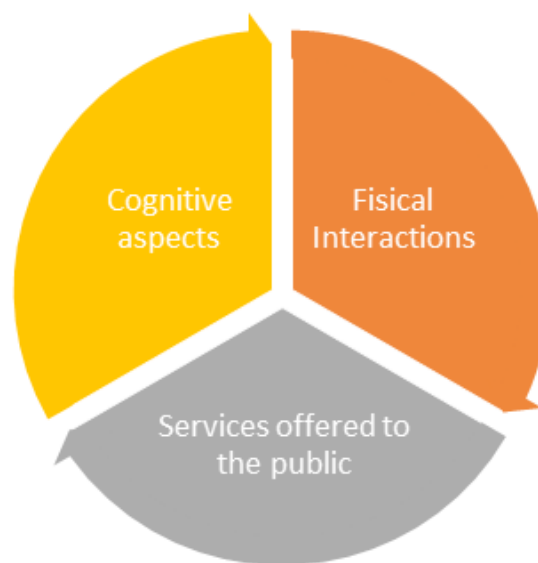


Diagram 2 - Observation script

Source: The authors (2017)

Concerning the physical interactions between the observed participants and the supermarket environment, aspects of regarding accessibility, signaling, management actions and lighting were annotated. Also, the locomotion and interaction with the supermarket trolley, as well as the state of conservation of the same and the possibility of offering some risk to the participant were observed, as well as the layout of the sectors and the physical characteristics of the establishment as corridor width, distance between the sectors, quality and safety of the floor and the escalator to access the store.

Among the factors related to signaling, were analyzed the way the participant was guided by the signs and which signs were available in the establishment, as well as the visualization of the price tags attached on the shelves. In the management actions, the handling and reach of the products in the shelves, and refrigerators, as well as the handling capacity of products slippery and weight were observed. As for lighting, aspects such as the discomfort perceived in the environment and sectors

with greater and lesser illumination could cause sensations of glare, contrast and sensitivity to light.

Finally, the services that the establishment offers to the elderly public were listed. Factors such as the existence and availability of employees to assist the elderly, as well as the waiting time for specialized care and existence of assistive technologies to the public. In terms of assistive technologies, it was observed the existence of adapted or motorized carts, rest benches and information totems. The act of finalizing purchase was also analyzed as part of the activity, as well as an availability of employees to assist in the packaging and transportation of purchases for the elderly consumers.

3. Results and Discussions

Through this analysis, the guidelines that can promote the wellbeing of the elderly in the supermarkets are obtained, making possible to enjoy the place with safety, autonomy and without the imminence of factors that may inflict embarrassment to these users. From this it is possible to identify solutions, if needed, for adaptations in the design configurations, such as resizing of corridors and shelves, limits of movements to reach the shelves, use of adequate lighting for each activity, among others.

Were selected three female participants with 66, 71 and 75 years old, respectively. During the structured interview, participant 1 reported that she is divorced, resides, and carries out her shopping alone. She does not present any kind of illness, physical or mental limitation. She frequents the supermarket only twice a month, says she does not like the carts because she thinks they are big and heavy, considers the environment unattractive, so her time at the supermarket is focused and brief.

Participant 2 is a widow that lives alone and tries to make her purchases only once a month. She suffers from epileptic seizures, and the medication itself has a side effect on memory lost and mood swings. It has been reported that her experience at the grocery store is quite stressful, and so she would like some company to assist her at the time of purchase as well as to feel more secure about her health condition.

Participant 3 is married, resides with her husband, but performs her shopping alone. For not driving, she frequents the market daily near her residence. She reported having a shoulder detachment, which prevents her from raising her arms and reaching high shelves. She considers her experience in the supermarket to be good, but believes that some spaces should be more organized and better signposted, and that, like participant 1, she does not like the carts, since they are big, heavy and often high for her to reach the supplies.

The observation itinerary was subdivided into three parts, and it took into account the aspects as cognition and perception of the participants (table 1), the physical interactions in the environment (table 2) and the services offered to the elderly public (table 3). Below in the text the tables and the description of some important points that were observed during the purchasing activities of the elderly participants.

Table 1. Cognitive aspects

	Participant 1	Participant 2	Participant 3
Activity time	70 minutes	37 minutes	53 minutes
Cordiality	Friendly	Unfriendly	Friendly
Interest and productivity	Disinterested	Impatient	Willing
Signs of tension, fatigue, hostility, insecurity or frustration	Fatigue	Tense	There was no sign
Communication	Communicative	Shy	Communicative

Source: The authors (2017)

During the shopping, participant 1 demonstrated a good mood, willingness to achieve her goals and demonstrated great patience when she did not find any products on her list on the first try. She showed tiredness throughout the activity, requesting a moment to sit down and then continue her shopping. Participant 2, in the first minutes of the activity, was cordial, but with few words and with clear signs of tension on the face.

Among the 23 items on her shopping list, she eliminated 5 items because she didn't find the brand of her preference or did not find the product. At any time she showed motivation to seek help from an employee, although it was noted that at times this would be an ideal way to achieve her purpose. She was too shy to interact with a "stranger". Due to her rush to complete the shopping activity, she abandoned some items on her shopping list. On the other hand participant 3 considered the supermarket environment pleasant and safe, was very communicative and did not need help.

	Participant 1	Participant 2	Participant 3
Accessibility	Had difficulties	Had no difficulties	Had no difficulties
Signaling	Does not use signaling	Used signaling	Used signaling
Handling actions	Distress	Distress	Little distress
Illumination	Dazzle	Good	Good

Table 2. Physical interactions

Source: The authors (2017)

Participant 1 had some difficulty in finding the sectors and seven products on the list because her difficulty of locating them spatially. At no time she mention or need to seek the help of any employee. As for accessibility, she chose to use a shopping cart. Later she mentioned the precariousness of the condition of the carts - these often had loose wheels and some loose metal components - as well as their functionality reduced to the function of carrying the purchases.

The participant went through the beverage, personal hygiene, bakery and dairy sectors. The observed participant demonstrated not to have the habit of be guided by the sign, she prefers to find the products on her list according to her deduction, and what she thinks would be at the right disposal of the sectors. It was observed that only the products on sale had signs of easy visualization. The other products had small plaques. In the beverage sector, there was liquid spillage on the floor, leaving it wet, but without adequate signage to this type of situation.

She had no difficulty accessing the supermarket by the escalators. The corridors presented irregular widths, some being broad and others narrow, with the aggravation of having pillars, these containing hanging promotional items. On the occasion of the passage through one of these corridors, the observed one bumped into the pillar, knocking down some products. The participant noticed that among the sectors covered, the drinks had lower lighting compared to others. On the other hand, she realized that the dairy sector had an illumination that produced a brief sensation of dazzling. She did not demonstrate difficulty in handling the products, since they were in height compatible with its postural action.

Participant 2 opted for using a shopping cart, and since they were far from the entrance of the store, the participant had to walk to the place where they were stored, and alone had to use force to release them. She entered the first corridor from the store, without planning this action very well, and then she paused for a brief moment to reorient herself and then proceed with the activity.

The participant went through the sectors of butchery, personal hygiene, bakery, dairy and hortifruti. The participant was objective regarding the orientation through the signs available in the store. Despite following the signs, once she was inside the corridor of whose product was on her list, she stopped for a while, which seemed like a moment of assimilation of the characteristics she was looking for in a product. Showed difficulty in the hortifruti sector and frustration in the hygiene sector, since she felt difficulty to access a product that was very close to the ground. Even so, completed the task quickly with a noticeable expression of physical discomfort. She did not make any complaints according to the lighting of the environment.

Participant 3 also opted for a shopping cart, but only noticed that these were away from the store entrance, minutes later, having to go back to pick it up. It was reported that the cart was very heavy and tall and she usually had difficulty putting and removing the products from it. She looked for the sectors to the hortifruti, bakery, dairy and hygiene products.

As for accessibility, she found the corridors wide and considered the signage very good, as she was able to find her products quickly. The price displays were fine and readable and the lighting ideal, except in some narrow corridors where the lighting was dark. As for the management actions, she claimed that she feels insecure when

some products, mainly those that have glass, are in the very edge of the shelves, because they could fall. It presented difficulty in the products that occupy the highest shelf, as it was noticed that some products are only arranged there, so out of her reach.

	Participant 1	Participant 2	Participant 3
Existence and availability of staff to help	Did not need help	Had no motivation to ask for help	Did not need help
Assistive Technology	The store does not have A.T.	The store does not have A.T.	The store does not have A.T.
Purchases checkout	No difficulty	No difficulty	Little difficulty
Aid with purchases	There was no assistance	There was no assistance	There was no assistance

Table 3. Services offered to the public

Source: The authors (2017)

Participant 1 did not need the help of employees, and during the activity was noticed the shortage of employees positioned between the sectors for occasional customer needs. The store does not have any assistive technology oriented to the elderly, only electric carts and a small food plaza with tables and chairs. In this case, the participant had no major constraints. At the time of finishing the purchase, there was no staff who was willing to pack and transport the purchases until her car at the parking.

Participant 2 did not present motivation to interact or request information for employees. At the time of observation, no employees were noticed who could assist the participant, only staff in function of repositories. The assistive technologies available were not focused at the elderly, but on the consumer in general. The only electronic devices of this type were the bar code scanners in the middle of the corridors (without location indication signaling). The participant had some moments of embarrassment and frustration, after not finding some products, and perceived the activity as stressful. At the cashier, there was no staff member to help her package the purchases, but the cashier was willing to help with this task. However, no assistance was offered to transport the participant products.

After the case study, the open interview was formalized at the end of the observation and the participants reported their experiences as well as their difficulties and discomforts in the supermarket environment. Participant 1 needed approximately 10 minutes of rest, she was slightly tired on the occasion of the long path tour inside the supermarket. She also complained about the layout of the products and store sectors, due to the fact that there is no logic in the organization of the sectors.

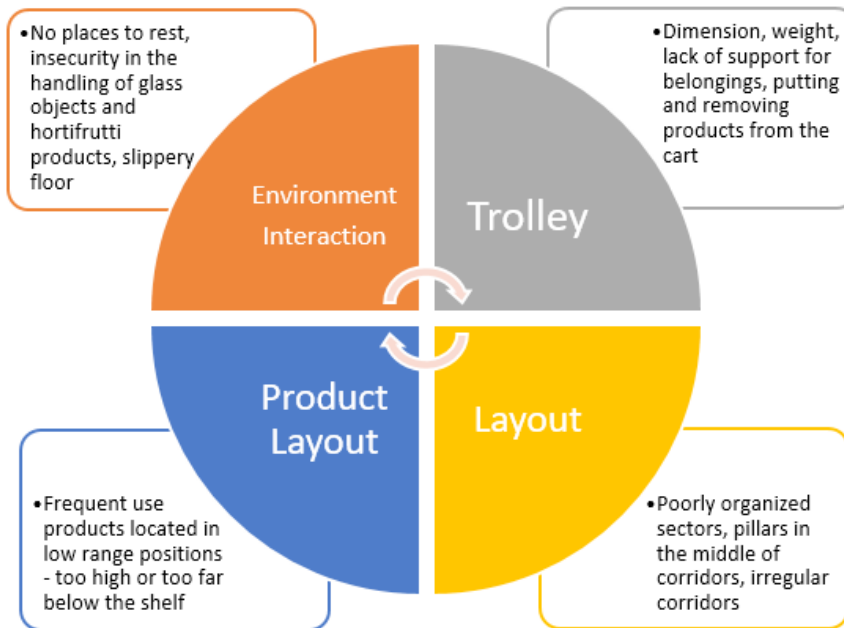


Diagram 3 - Results for the problems found

Source: The authors (2017)

Participant 2 got nervous in some situations that demanded more attention, such as searching for nutritional information on the labels or expiration dates of the products. Participant 3, despite finding some difficulties in reaching the shelves and placing and removing products from the cart, considered it a good experience, and liked the accessibility of the place, with wide corridors, and found the needed products quickly.

6. Conclusions

The approach of human factors in the context of interior design is of utmost importance, regarding the constant improvement of the design prospects that ergonomists must be aware of. Since the user-centered design allows the effective insertion of different age profiles according to their needs, skills and limitations, promoting the social interaction required for healthy aging, while ensuring the maintenance of design processes.

This article reports the beginning of a research that is under development. However, it already can be noted that several elements on the supermarket do not take into account the elderly public. As shown in the observations and interviews of this study, one of these elements was the trolley, that all participants reported their discontent, and it shows the urgent need for a redesign. Was also possible to realize that in general there is still much to implement in supermarkets, as much in the store interior design as related to the staff interaction with the elderly consumers.

Although the elderly participants of the observations reported some difficulties, they were in smaller numbers than expected, but for more accurate conclusions it would be necessary to repeat the study with a larger group of volunteers and take more precise and technical measurements of the elements involved. This article may be used to guide students and interested researchers about this issues. For future studies this research must be extended to achieve more information about how to design for ageing and provide social inclusion.

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