v. 2, n. 17, 2022

International Journal of Health Science

FOOD ASPECTS IN THE UNIVERSE OF DISABILITY VISUAL

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Abstract: Introduction: approximately 20.0% of the Brazilian population has some degree of visual impairment, which affects various aspects of the individual's life, including diet, which is related both to difficulties in buying and preparing food and to the loss of autonomy when eating. **Goal:** to understand aspects of food in the visually impaired universe, addressing the obstacles encountered and the mechanisms used to circumvent them, in addition to exploring the existence of national public policy guidelines focused on improving food for a better quality of life for this vulnerable group. **Methodology:** this is a bibliographic documentary study of an integrative literature review. **Results:** no studies were found that specifically addressed the topic in focus, with visual impairment being addressed as a secondary aspect of a main researched topic. Among the nine studies analyzed, high rates of obesity and overweight, greater chances of developing diabetes, low adherence to physical activity, less varied diet and difficulties related to autonomy in eating are mentioned. Only two legislations on the subject were found: the Statute of the Person with Disabilities, which does not cover the eating difficulties of the visually impaired, and the Law of Menus in Braille, of municipal scope (city of São Paulo), which would be more relevant if it reached the national territory. The main obstacles encountered were the lack of autonomy for the purchase and preparation of food, and the lack of tactile accessibility to labels and menus. The main coping mechanisms identified were the acquisition and consumption of ultra-processed foods, little varied food and help from family members and/or third parties. **Conclusion:** Overcoming obstacles is complex, resulting, predominantly, in a diet that is not very varied and rich in ultra-processed foods. The scarcity of studies and legislation on the subject was confirmed. It is

important that more research is carried out and that new public policies are designed for this vulnerable group.

Keywords: Nutrition, Blindness, Visually impaired people.

INTRODUCTION

The concept of visual impairment is complex and, according to Torres and Santos (2015, p. 36), "comprises people who are blind and have low vision", and "both terms have their own definitions and characteristics". According to Dias de Sá, Campos e Silva (2007, p. 15), "blindness is a serious or total alteration of one or more of the elementary functions of vision that irremediably affects the ability to perceive color, size, distance, shape, position or movement in a more or less comprehensive field". On the other hand, low vision can be interpreted in different ways: "significant low visual acuity, significant reduction in the visual field, cortical changes and/or sensitivity to contrasts, which interfere with or limit the individual's visual performance" (BRASIL, 2006, p. 16). Among the main causes of visual impairment are: retinopathy of prematurity, retinal degeneration, visual changes in the cortex, glaucoma and congenital cataract (GIL, 2000).

According to the 2010 Census Booklet – People with Disabilities (BRASIL, 2012), 18.6% of the Brazilian population has some degree of visual impairment, with the most common disability in the Brazilian population when compared to the others: motor, hearing, mental and/or intellectual. When considering only severe visual impairment, this predominance remains compared to other disabilities, reaching 3.46% of the Brazilian population, a rate that is 1.6% for blindness (BRASIL, 2012).

The same survey showed that visual impairment was the most prevalent in all age groups, being quite pronounced in the group over 65 years (49.8%) (BRASIL, 2012). The group from 0 to 14 years old had relatively low frequencies of all types of disability, with the visual being the one with the highest frequency (5.3%) (BRASIL, 2012). When comparing the sexes, the prevalence of visual impairment is higher in women (21.4% x 16.0%) (BRASIL, 2012).

Monteiro (2012, p.3) explains:

> Whatever the causes of visual impairment, in order for the individual to have better conditions for social inclusion, access to cultural goods available in society and to enjoy their rights as citizens, it is necessary to carry out an assessment both at the medical and the physical level. functional level of vision. Both have the main purpose of identifying the degree of visual loss, that is, whether there is total absence of vision or not, so that the appropriate resources are made available to each individual, considering the specificities of both the blind and those with low vision.

Visual impairment can affect several aspects of an individual's life, presenting a profound degree of limitations, making it difficult for several sectors of their daily lives, including their diet. Studies mention that most visually impaired people have a body mass index (BMI) below or above what would be considered within the normal range (BENVENUTTI, 2018; MONTERO, 2005; ROEBOTHAN, 1999). Furthermore, Capella-Mcdonnall (2005) found that obesity and overweight rates in this population have been increasing, contributing to the emergence of other health problems such as the arterial hypertension, diabetes, dyslipidemia and metabolic syndrome (BAUMAN; SPUNGEN, 2001). This situation may be related to the difficulties encountered for them to have a healthy diet. Based on the studies by Campos and Sousa (2015), among the difficulties present at the time of eating, one of them is the physical capacity that limits shopping, food preparation and autonomy when

eating. In addition, there are obstacles in the identification of food, since most industrialized products do not contain information in the Braille System on the labels.

Thus, this article aimed to understand aspects of food in the visually impaired universe - addressing the obstacles encountered and the mechanisms used to circumvent them - and explore the existence of national public policy guidelines focused on improving food for better quality. of life for this vulnerable group.

METHODOLOGY

It is a bibliographic documentary study of integrative literature review, "a method that aims to synthesize results obtained in research on a delimited theme or question, in a systematic and orderly manner, with the objective of contributing to the knowledge of this theme or question" (ROMAN; FRIEDLANDER, 1998, p. 109). For the development of this review, the following steps proposed by Mendes, Silveira and Galvão (2008) were covered: identification of the theme and elaboration of the research question, establishment of criteria for inclusion and exclusion of studies, definition of the information to be extracted from the studies selected, evaluation of included studies, interpretation of results and presentation of the integrative review.

To search for online articles, public policies and legislation, the strategies used were based on the following descriptors: "visually impaired" and "nutrition" in English and "visual disability" and "nutrition" for searches in Spanish, according to the Health Sciences Descriptors (BVS, 2019). To compose the study, all articles available online were selected, located through the aforementioned search strategies and that met the inclusion and exclusion criteria, published in the Virtual Health Library. (BVS), no *Scientific Electronic Library Online* (SCIELO), in PubMed and in the Portal of Periodicals of the Coordination for the Improvement of Higher Education Personnel (CAPES). National public policies and legislation related to the subject were also analyzed, which were additionally researched on the websites of the Ministry of Health, Ministry of Education, Association of Visually Impaired and Friends (ADEVA), Brazilian Council of Ophthalmology (CBO) and Brazilian Society of Ophthalmology (SBO).

In the search and selection process, the following inclusion criteria were adopted: scientific articles (originals, experience reports, theoretical essays) available online completely and free of charge, in English, Portuguese and Spanish and that dealt with the characteristics of the diet of visually impaired in its different aspects, as well as public policies and national legislation on the subject. The exclusion criteria were: articles on only one of the subjects of interest (visual impairment or nutrition), as well as duplicate articles and literature review articles.

According to the procedures described, nine articles were selected to compose this literature review (Table 1).

No significant number of laws and public policies related to the topic of the article were found. Thus, in addition to the articles, a material on the Ministry of Health website and on the ADEVA website were also located and selected for analysis. Thus, the research corpus consisted of nine articles and two legislations (Table 1), one at a national level and another at a municipal level, in the city of São Paulo (SP).

RESULTS AND DISCUSSION

From the readings carried out, the scarcity of studies on the subject of this article was confirmed. Although one of the legislation dates from 1997, the articles are published from 2009 and only one more legislation deals with the subject, being from 2015, that

Steps per Database	Total of studies
BVS	
General research	188
Duplicated	15
Language other than those specified	1
Articles unavailable in full	94
Articles not available for free	31
Articles	47
Not related to topic	41
Selected for full Reading	6
No adherence to the purpose of the study	0
Selected for results analysis	6
SCIELO	
General research	4
Articles	4
Not related to topic	3
Selected for full Reading	1
Selected for results analysis	1
PUBMED	
General research	51
Articles unavailable in full	5
Articles not available for free	15
Articles	31
Not related to topic	0
Selected for full reading	31
No adherence to the purpose of the study	29
Selected for results analysis	2
CAPES	
General research	81
Duplicated	7
Articles unavailable in full	1
Articles	73
Not related to topic	72
Selected for full Reading	1
No adherence to the purpose of the study	1
Selected for results analysis	0

Table 1. Results of article searches for data collection and analysis.

Source: Prepared by the authors (2021).

Number	Reference
1	BEZERRA, Camilla Pontes; PAGLIUCA, Lorita Marlena Freitag; GALVÃO, Marli Teresinha Gimeniz. Modelo de enfermagem baseado nas atividades de vida diária: adolescente diabética e deficiente visual. **Escola Anna Nery**, v. 13, n. 4, p. 842-848, 2009.
2	CHIU, Chung-Jung; ROBMAN, Luba; MCCARTY, Catherine Anne. Dietary carbohydrate in relation to cortical and nuclear lens opacities in the Melbourne Visual Impairment Project. **Investigative ophthalmology & visual science**, v. 51, n. 6, p. 2897-2905, 2010.
3	BARBOSA, Giselly Oseni Laurentino *et al*. Comunicação verbal e não verbal de mãe cega e com limitação motora durante alimentação da criança. **Acta Paulista de Enfermagem**, v. 24, n. 5, p. 663-669, 2011.
4	BADILLA, Pablo Antonio Valdés; CUMILLAF, Andrés Esteban Roberto Godoy; VALENZUELA, Tomás Nicolás Herrera. Somatotipo, composición corporal, estado nutricional y condición física en personas con discapacidad visual que practican goalball. **International Journal of Morphology**, v. 32, n. 1, p. 183-189, 2014.
5	CHO, Ga Eun; LIM, Dong Hui; BAEK, Minji. Visual impairment of Korean population: prevalence and impact on mental health. **Investigative ophthalmology & visual science**, v. 56, n. 8, p. 4375-4381, 2015.
6	GAWLIK, Krystyna; ZWIERZCHOWSKA, Anna; ROSOŁEK, Barbara. Evaluation of lipid metabolism and nutritional status in male goalball players. **Journal of human kinetics**, v. 48, n.1, p. 141-147, 2015.
7	BOZKIR, Çiğdem; ÖZER, Ali; PEHLIVAN, Erkan. Prevalence of obesity and affecting factors in physically disabled adults living in the city centre of Malatya. **BMJ open**, v. 6, n. 9, p. 1-9, 2016.
8	HUNG, Shu-Ling; CHEN, Mei-Fang; LIN, Yu-Hua. Lifestyle in Visually Impaired or Blind Massage Therapists: A Preliminary Study. **Journal of Nursing Research**, v. 26, n. 5, p. 348-355, 2018.
9	DAMAZIAK, Krzysztof; STELMASIAK, Adrian; RIEDEL, Julia. Sensory evaluation of poultry meat: A comparative survey of results from normal sighted and blind people. **Plos One**, v. 14, n. 1, p. 1-24, 2019.
10	MUNICÍPIO DE SÃO PAULO. **Lei nº 12.363, de 13 de junho de 1997.** Dispõe sobre a obrigatoriedade da utilização de cardápios impressos em "braile" em bares, restaurantes, lanchonetes, hotéis e similares, no município de São Paulo. São Paulo, SP: Prefeito de São Paulo, 1997. Disponível em: https://www.adeva.org.br/fiquepordentro/leicardapios.php. Acesso em: 20 maio 2021.
11	BRASIL. **Lei nº 13.146, de 06 de julho de 2015**. Institui a Lei Brasileira de Inclusão da Pessoa com Deficiência (Estatuto da Pessoa com Deficiência). Brasília, DF: Presidência da República, 2015. Disponível em: www.planalto.gov.br/ccivil_03/_Ato2015-2018/2015/Lei/L13146.htm. Acesso em: 20 maio 2021.

Table 1. Selected research corpus, in chronological order by year of publication.

Source: Prepared by the authors (2021).

is, eighteen years after the first one. No other legislation on this subject was found in this long period of time. In addition, no more than one article per year was found, except in 2015, in which there were two publications related to the topic.

Among the articles analyzed, there was no research that specifically addressed aspects of food in the universe of visual impairment, all relate visual impairment to some other aspect and, within their explanation, mention something related to the topic addressed in this study.

The study by Bezerra, Pagliuca and Galvão (article 1) aimed to analyze the effectiveness of nursing care for a visually impaired teenager based on the Nursing Model Based on Activities of Daily Living. In it, it was found that the main person responsible for feeding the visually impaired person was their mother and that the main problems related to food were more related to Diabetes Mellitus, a pathology presented by the visually impaired, than to the visual impairment itself (BEZERRA; PAGLIUCA; GALVÃO, 2009). It is assumed that this is due to the non-acceptance of the diabetic condition, since the difficulties mentioned in the study were related to the consumption of sweets, with no complaints due to the deficiency being mentioned.

The aim of article 2 was to examine the cross-sectional association between total carbohydrate intake, dietary glycemic index (dGI) and the risk of cortical and nuclear cataracts. There was an association between cortical cataract and total carbohydrate intake, however, for nuclear cataract there was significance, but no consistent dose-response association (CHIU; ROBMAN; MCCARTY, 2010). Based on the results found, the authors suggested that carbohydrate intake can be optimized to prolong the function of the eye lens, but concluded that further studies on the subject are needed (CHIU; ROBMAN; MCCARTY, 2010).

Barbosa et al. (2011), in article 3, aimed to analyze the verbal and non-verbal communication of a blind mother with motor limitations with her child and nurse during child feeding. The authors found that, for blind mothers, simple acts such as breastfeeding, bathing, feeding and administering medication take on complex dimensions, even generating stress and insecurity in the care of their child. They also noticed that the lack of visual contact between the blind and their interlocutor leads them to ignore the importance of face to face for the seer, and often, they fail to address the person with whom they are interacting. In addition, although without vision, interactions with the child were permeated by physical contact, such as touches, caresses and tactile relationships. However, it is worth mentioning that the gestures demonstrated by the mother did not complement her verbal language, constituting a loss in her non-verbal communication. However, the authors considered that this issue was also related to the physical limitation of the mother and not just her visual impairment (BARBOSA et al., 2011).

Pagliuca, Uchoa and Machado (2009) state that blind parents compensate for the lack of vision by using other senses such as smell, touch and hearing in caring for their sighted children, as mentioned in the article by Barbosa et al. (2011). In addition, they considered the daily activities performed in the parent-child relationship complex, such as when breastfeeding, bathing and administering medication (PAGLIUCA, UCHOA and MACHADO, 2009), in agreement with the work of Barbosa et al. (2011).

Article 4 measured somatotype, body composition, nutritional status and physical condition, through structural and functional aspects, in visually impaired people who

play goalball in the Araucania region, Chile. With a sample of 11 men, with an average age of 42 years, average weight of 74.76Kg and average height of 1.695m, the results allowed classifying the athletes as mesoendomorphs, reaching 28.78% of the fat mass and 42.71% of the muscle mass, while the BMI was 26.05 kg/m². The authors concluded that 45.45% of those evaluated had normal nutritional status and 54.54% were overweight or obese (BADILLA; CUMILLAF; VALENZUELA, 2014).

The study by Cho, Lim and Baek (article 5) sought to identify the prevalence and sociodemographic characteristics of people with visual impairment and to determine the relationship between disability and mental health in the Korean population. The study showed that 0.43% of the participants had visual impairment and that, after adjusting for sex, they were significantly older, with a higher prevalence in the age group over 70 years. After adjusting for age and sex, the visually impaired group had a higher odds ratio for being single or separated/divorced, having Diabetes Mellitus, less schooling, being unemployed and having restricted daily activity, compared to the control group (CHO; LIM ; BAEK, 2015).

According to the authors, visual impairment, by itself, was not related to mental health problems. However, restricted daily activity was the strongest risk factor for mental health problems (depression, suicidal ideation, and perceived stress). Visually impaired people had significantly unfavorable sociodemographic status data. For the authors, restricted daily activity and poor sociodemographic factors found in visually impaired people increase the risk for mental health problems (CHO; LIM; BAEK, 2015).

The aim of article 6 (GAWLIK; ZWIERZCHOWSKA; ROSOŁEK, 2015) was to evaluate the lipid profile and nutritional status of male goalball players. The study was carried out in Poland and, until 2015, no study relating nutritional status and lipid levels had been carried out in visually impaired people in that region. According to the authors, the regular involvement of visually impaired people in sports is likely to reduce cardiovascular risk. The sample consisted of 32 male goalball players, blind or visually impaired, aged between 20 and 45 years and involved in athletic activities for at least three years. Overweight was found in 40.6% of the athletes, with obesity being around 9.3%. Abdominal obesity, expressed by waist circumference (WC), was observed in 43% of study participants, while excess visceral fat was found in 28% (GAWLIK; ZWIERZCHOWSKA; ROSOŁEK, 2015).

A high correlation was found between visceral fat and BMI ($p < 0.001$), as well as the visceral fat and WC ($p < 0.001$). In addition, lower levels of individual components of lipid profiles (and higher levels for HDL) were found in athletes with both normal BMI and standard WC. Although all participants in this study had a history of involvement in athletic activities for at least three years, the authors concluded that regular engagement in sports is likely to reverse this negative trend. (GAWLIK; ZWIERZCHOWSKA; ROSOŁEK, 2015).

In this regard, the authors reported that, due to the existence of difficulties with daily life, the blind and visually impaired are often exposed to chronic stress, which can contribute to the accumulation of excess visceral fat, despite regular physical activity. In that study (article 6), 21.9% of blind and visually impaired athletes had high total cholesterol levels. This percentage was lower compared to results obtained in surveys conducted in the general population of Poland. It can be expected that the most favorable lipid profile compared to the national level survey was obtained due

to the regular physical activity of the study population (GAWLIK; ZWIERZCHOWSKA; ROSOŁEK, 2015).

The small sample size and the fact that the literature does not provide data on non-athletes who are blind or visually impaired suggest that more research is needed on the problems of this population, both athletes and non-athletes (GAWLIK; ZWIERZCHOWSKA; ROSOŁEK, 2015). During our study we also identified the summarized range of research in the visually impaired population, both related to food and nutrition, as well as the practice of physical activity and daily autonomy.

Bozkir, Özer and Pehlivan (2016), in article 7, investigated the prevalence of obesity and the risk factors associated with it, in a sample of 258 adults with physical disabilities living in the city center of Malatya, Turkey, aged between 20 and 65 years, 61 of whom were visually impaired. The overall prevalence of obesity was 13.2%, while among the visually impaired it was 21.3%, with the highest prevalence of obesity according to the type of disability ($p < 0.01$). Furthermore, the prevalence of obesity increased among participants who did not exercise regularly, which showed that educational interventions on nutrition and lifestyle can be effective. The authors also considered that training people with disabilities in the appropriate sport for their type of limitation and in appropriate facilities for these sports can have a positive effect (BOZKIR; ÖZER; PEHLIVAN, 2016).

According to the authors, deficiency can cause the development of obesity, limiting physical activity. In addition, it is a problem that not only affects the individual with the difficulty, but also their family and their immediate social environment, in the economic, social and psychological spheres. After all, obesity causes many health problems and, when it is present in the life of a person with a disability, it further restricts an already limited life capacity, increasing the burden of disease (BOZKIR; ÖZER; PEHLIVAN, 2016).

According to research by Bozkir, Özer and Pehlivan (2016), 86.9% of visually impaired participants did not perform physical activity, 21.3% were obese. In this study (article 7), no significant relationship was found between education and type of disability, and it is important to note that 16.4% of the visually impaired were illiterate or had incomplete elementary education and that the proportion of illiterate people with disabilities is greater than the proportion of illiterates in the general population (BOZKIR; ÖZER; PEHLIVAN, 2016). Illiteracy implies less access to information, whether in relation to healthy eating or in relation to the complications that an unruly diet can cause.

Although several comparisons were made between the types of disabilities, at various times in this research, information about the visually impaired was omitted (BOZKIR; ÖZER; PEHLIVAN, 2016). Studies similar to article 7, relating only the visually impaired, were not found and would be of great value to this population.

Study 8 was an exploratory study, carried out with 50 participants, with a mean age of 46.8 years, the majority being male (70%) and half married (50%), with nine or more years of study (84 %) and monthly income less than 1000 dollars (92%). The objective was to investigate the lifestyle and behaviors of blind and visually impaired massage therapists in Taiwan. According to the authors, restricted access to health information may limit the ability of people with visual impairments or blindness to adopt healthy lifestyles, but no studies have investigated how lifestyle practices affect health, specifically in blind and visually impaired populations. visual impairment (HUNG; CHEN; LIN, 2018), which is in accordance with article 7.

Low-level physical activity scores in this population can be improved by developing physical activity programs at home and in the workplace and establishing community recreation and exercise facilities for visually impaired populations (HUNG; CHEN; LIN, 2018).), as also mentioned in article 7 (BOZKIR; ÖZER; PEHLIVAN, 2016). The low scores for nutrition found in the study (Article 8) can be improved by establishing nutrition education programs specifically designed for the blind and visually impaired, in order to increase consumption of fresh produce and other healthy foods and requiring food manufacturers to foods use labels that can be easily read or understood by visually impaired populations (HUNG; CHEN; LIN, 2018).

According to Hung, Chen and Lin (2018), in addition to visual dysfunction substantially limiting career and occupational options, blind people may have difficulty reading health information in various electronic and printed media, such as brochures, pamphlets, etc. brochures and newspapers. In addition, people with blindness may be discouraged from engaging in physical activity at home, the workplace, and community recreation centers because of fears of becoming disoriented, injured, or even immobilized in falls. According to the authors, maintaining good nutrition can be complicated by difficulties in buying food, identifying foods, reading nutrition labels and even preparing meals. These and similar activities, which are routine for sighted people, can be extremely challenging for people with blindness (HUNG; CHEN; LIN, 2018).

Regarding health-related variables, almost 26.5% of the participants in this study reported that they had never exercised, 26.0% reported smoking, 38.8% reported habitual alcohol consumption, and 22.0% reported habitually chewing betel nut. (HUNG; CHEN; LIN, 2018). Still, 91.5% defined their visual impairment as moderate or severe, and 34.0% reported that their visual impairment caused difficulty in accessing medical services (HUNG; CHEN; LIN, 2018).

For Hung, Chen and Lin (2018), there is great concern regarding nutrition labels, since food manufacturers usually print nutritional information on packaging in a way that is not accessible to the visually impaired. These problems can be reduced by requiring food manufacturers to use a tactile writing system, such as Braille, or QR codes that can be easily read by the visually impaired consumer or read by a text-to-speech system, in order to provide information. nutritional supplements accessible to this audience on packaging (HUNG; CHEN; LIN, 2018).

Finally, the data from article 8 indicate that educational programs must aim at improving personal nutrition and increasing consumption of fresh and other healthy products and that food manufacturers must be obliged to provide accessible nutritional information to the visually impaired in packaging, either through tactile writing or other formats (HUNG; CHEN; LIN, 2018).

Article 9 aimed to verify whether blind people evaluate the same food products differently from consumers with normal vision, and, if so, how big the difference can be (DAMAZIAK; STELMASIAK; RIEDEL, 2019). According to the authors, the appearance of food products can affect their perception by other senses, sometimes giving a false image of their quality. Furthermore, a true assessment of sensory attributes such as aroma, flavor, tenderness and juiciness, which are components of the general taste of foods, without the use of instrumental methods, would be feasible only by blind people (DAMAZIAK; STELMASIAK; RIEDEL, 2019).

This study found that the diet of the blind was considerably less varied compared to that

of sighted people, who determined what and when to eat on their own. The results indicated many differences in the perception of sensory impressions used in food evaluation between sighted and blind consumers and also confirm the fact that blindness is compensated by other senses responsible for food evaluation (DAMAZIAK; STELMASIAK; RIEDEL, 2019).

Regarding the laws found, there was not a considerable number, having been located only two, among which there was a considerable gap in time. Number 10 (MUNICIPALITY OF SÃO PAULO, 1997) discusses the requirement that menus have the option in Braille in the city of São Paulo, however, similar ones were not found in other locations or federative units, as well as it did not become a federal law. This municipal law is consistent with the considerations presented in article 8 (HUNG; CHEN; LIN, 2018), which recommend printing labels, menus and the like in an accessible way for the blind so that they can have a healthier diet.

Item 11 analyzed in this review (Table 1) refers to the Statute of Persons with Disabilities (BRAZIL, 2015), which was only enacted in 2015. It is a series of federal standards that encompasses the various types of disability, however, this legislation does not present any specific mention regarding the food and/or nutrition of the visually impaired (BRASIL, 2015). This is also the case with the National Health Policy for Persons with Disabilities (BRASIL, 2008), which reaffirms the rights of people with disabilities, but does not provide any specific mention in relation to the visually impaired, nor does it provide alternatives for nutritional education. for this population.

It was found that several laws (DEFENSORIA PÚBLICA DO ESTADO DO PARÁ, [2011?]; BRASIL, 1988; BRASIL, 1989; DISTRICT FEDERAL, 2009; ESTADO DO RIO GRANDE DO SUL, 2009; BRASIL, 2015), which discuss the rights of people with disabilities, they talk about the right to accessibility to places, digital access to information, assistance with a guide dog and priority service. However, in relation to food for the visually impaired, what would be needed to encourage their autonomy goes beyond that, and includes writing in Braille on menus and packaging, as recommended in relation to menus in Law number 1997, from the city of São Paulo (MUNICÍPIO DE SÃO PAULO, 1997), or, also, the use of technology with QR code and its own applications so that the visually impaired can know what they are buying in a market or what they are going to consume in a restaurant. In addition, for the visually impaired to become increasingly independent and cook their own food, it is essential to develop options for home appliances adapted to this population, with indicators in Braille, in addition to the existing timers.

Federal Law number 7853/89 (BRASIL, 1989), in its article 2, guarantees people with disabilities the right to promote preventive actions related, among other things, to the nutrition of women and children and to metabolic diseases, in addition to the development of programs health services for people with disabilities. Among the constitutional rights, it is up to the family, society and the State to provide comprehensive assistance to the health of children and adolescents, ensure the right to food and create prevention programs and specialized care for people with disabilities (BRASIL, 1988). Law number 4,317, of April 9, 2009, of the Federal District (DISTRITO FEDERAL, 2009), which establishes the District Policy for the Integration of Persons with Disabilities, corroborates the 1988 Constitution, in relation to the right to health and food. In the same way, Law number 13.146, of July 6, 2015, also discusses the duty of the State, society and

the family to ensure the disabled person, with priority, the realization of the rights related to life, health, food, accessibility, dignity, respect, freedom, family and community life (BRASIL, 2015). However, no Public Policy was found aimed at Food and Nutrition for the Visually Impaired and encouraging their autonomy in this sense.

According to Bagni and Borges (2021), to improve the quality of life of the visually impaired, it is necessary to implement educational activities in order to promote improvements in food, such as: nutritional education, nutritional guidance and individualized nutritional care. For this, it is indisputable to adapt activities to the visually impaired, developing actions that meet the particular requirements of this vulnerable group and thus boosting their autonomy and inclusion (BAGNI; BORGES, 2021).

Law number 13,146, of July 6, 2015, is intended to ensure and promote, under conditions of equality, the exercise of fundamental rights and freedoms for people with disabilities, aiming at their social inclusion and citizenship (BRASIL, 2015). In its article 9, paragraph III, it says that the priority service would have the purpose of making resources available, both human and technological, to guarantee service on equal terms with other people (BRASIL, 2015). However, this is not perceived as occurring in the daily life of the visually impaired when it comes to buying, consuming or preparing food. Article 69 of the same law says that the public power must ensure the availability of correct and clear information about the different products and services offered, by any means of communication used, including in a virtual environment, containing the correct specification of quantity, quality, characteristics, composition and price, as well as possible risks to the health and safety of consumers with disabilities (BRASIL 2015). However, this does not happen when a visually impaired person needs to go to the market to do their shopping and is faced with labels with no information available in a format adapted to their disability or when they go to a restaurant and cannot read the menu.

Nutritional education specifically aimed at this population is of paramount importance, and the creation of Public Policy and also specific mechanisms oriented towards this end is strongly recommended. At least seven studies analyzed in this work – articles 1, 2, 5, 6, 7, 8 and 9 – confirm this need (BEZERRA; PAGLIUCA; GALVÃO, 2009; CHIU; ROBMAN; MCCARTY, 2010; CHO; LIM; BAEK, 2015; ; GAWLIK; ZWIERZCHOWSKA; ROSOŁEK, 2015; BOZKIR, ÖZER and PEHLIVAN, 2016; HUNG; CHEN; LIN, 2018; DAMAZIAK; STELMASIAK; RIEDEL, 2019). Abreu, Friedman and Fayh (2011), when addressing physical, hearing and visual disabilities, state that the diet of people with disabilities deserves greater attention and care, due to the higher rates of obesity that these groups have and because they are more vulnerable to being affected by other non-infectious chronic diseases. In addition, they are more predisposed to osteopenia and kidney stones.

The study by Machado et al. (2016), with 12 visually impaired people from the city of Santa Maria - RS, also demonstrated this trend, when it was verified that half of those who participated in the research were overweight or obese. Likewise, in the study carried out by Scherer and Karasiak (2017), in Florianópolis, with 43 visually impaired people, a similar result was found, where only 40% of the participants had a nutritional status within the normal range.

Many reasons are related to the food choices and nutrition of the visually impaired. These individuals even opt for fresh food, but most of the disabled cannot identify whether

or not the food is suitable for consumption. Adding to this are the fears involved in the cooking process, such as peeling food and handling the stove, in addition to difficulties with cooking utensils. A study carried out in the city of São Paulo revealed that, in the absence of people who prepare meals for the disabled, these individuals end up looking for products that are easily accessible and less nutritious (BAGNI; BORGES, 2021), that is, ultra-processed foods.

The articles mentioned (BEZERRA; PAGLIUCA; GALVÃO, 2009; CHIU; ROBMAN; MCCARTY, 2010; CHO; LIM; BAEK, 2015; GAWLIK; ZWIERZCHOWSKA; ROSOŁEK, 2015; BOZKIR, ÖZER and PEHLIVAN, 2016; HUNG; CHEN; LIN, 2018; DAMAZIAK; STELMASIAK; RIEDEL, 2019) show concern about chronic non-communicable diseases such as diabetes, dyslipidemia, cardiovascular problems, visual problems caused by dietary errors and obesity, in addition to a sedentary lifestyle, which is striking in this population. The necessary public policies would encompass not only food, but also mechanisms for the practice of specific physical activity for this group, with appropriately adapted sports, such as goalball, mentioned in two of the articles analyzed in this research (articles 4 and 6) (BADILLA; CUMILLAF; VALENZUELA, 2014; GAWLIK; ZWIERZCHOWSKA; ROSOŁEK, 2015).

The analyzed studies confirm that physical activity combined with healthy eating would help this population in the fight against overweight, cardiovascular diseases and mental health problems, in addition to encouraging the autonomy of this population group (BADILLA; CUMILLAF; VALENZUELA, 2014; CHO ; LIM; BAEK, 2015; GAWLIK; ZWIERZCHOWSKA; ROSOŁEK, 2015; BOZKIR, ÖZER and PEHLIVAN, 2016; HUNG; CHEN; LIN, 2018).

According to Scherer and Karasiak (2017), despite the importance of physical exercise for people's quality of life, in the visually impaired group this habit is still not so frequent, and the number of individuals who adhere to activities is negligible, especially among those who are visually impaired. blind and low vision subjects. Thus, high rates of sedentary people contribute to the emergence of overweight and obesity and favor the development of other non-communicable chronic diseases.

Article 8 (HUNG; CHEN; LIN, 2018) showed high scores on spiritual growth and interpersonal relationships and low scores on physical activity and nutrition, which corroborates the need to develop a program to increase physical activity in home and in the environment. workplace, as well as the need to establish physical exercise facilities for populations with disabilities in local communities (HUNG; CHEN; LIN, 2018). Existing outdoor gyms currently only target the physical disability, with no tactile directional floor accessibility or Braille guidance at these locations.

There is no doubt that visually impaired people present greater obstacles compared to people without the disability to have and maintain a healthy diet. This fact may be linked to less access to information on healthy eating and also to difficulties encountered by health professionals in communicating with this group (BAGNI; BORGES, 2021).

Accessibility is an extremely important factor that provides improvements and autonomy for the daily lives of the visually impaired, as well as promoting social integration, thus ensuring that these individuals are able to enjoy the spaces around them. Thus, despite being frequent users, people with visual impairments are still part of a group with little representation in the consumer market. In addition to this, there is a lack of studies that relate nutrition and the

packaging of food products to the obstacles that the disabled encounter. In this sense, greater attention is suggested to aspects of the diet of visually impaired people, in order to provide them with a better quality of life (DOS SANTOS SOARES et al., 2020), in addition to contributing to the guarantee of their rights – health and adequate and healthy food.

The Braille system of reading through touch, mentioned both in article 8 (HUNG; CHEN; LIN, 2018) and in law number, is the most used resource in the packaging of food products, but it is not enough, since not all visually impaired people know the language. In addition, some packages, due to the material, are not adaptable for writing in this system and, consequently, it is essential to develop assisted technologies to serve this specific group of the population, eliminating barriers that make it difficult to read and access labels (DOS SANTOS SOARES et al., 2020).

CONCLUSION

This bibliographic-based study aimed to understand aspects of food in the visually impaired universe, including addressing the obstacles encountered and the mechanisms used to circumvent them, in addition to exploring the existence of national public policy guidelines focused on improving the food for a better quality of life for this group.

The analysis of the literature showed that several adversities are found for the visually impaired to develop their autonomy in adopting a healthy diet. Among these adversities, we highlight the difficulty in choosing food at the time of purchase, the lack of accessible information for the visually impaired on labels, packaging and menus, in addition to the impediments imposed at the time of preparing meals.

The visually impaired get around these obstacles in the most diverse ways, either by consuming ready-to-eat foods, which require minimal manipulation in preparation, often requiring only the microwave oven, or through the help of third parties who help them at the time of purchase., reading or guiding the content of labels, packaging and menus, as well as preparing meals. Sometimes the people who help them are family members, sometimes they are employees of the establishment or even people who are totally strangers to their socializing.

Thus, considering the context of visual impairment as a whole, it appears that the balance between obstacles and coping resources available to the visually impaired still results in a diet that is not very varied and rich in foods that are practical and easy to consume, generally of low nutritional density and high degree of processing, with damage to health, increasing the vulnerability burden of this group.

It must be noted that, from the analysis carried out, the scarcity of studies and legislation on the subject of this research was confirmed, especially in the Brazilian context, demonstrating that the treatment of this topic is far below its merit and social relevance. In view of these observations, it is important and urgent that more researchers dedicate themselves to the topic of diet in visually impaired people in its different aspects. Conducting research in this area can represent an impetus for the development of public policies specifically designed for this group, as well as technologies to improve their quality of life, contributing to the guarantee of their rights and dignity.

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