

Occurrence and characterization of dizziness in the elderly assisted in a Family Health Strategy (FHS)

Ocorrência e caracterização da tontura em idosos atendidos em uma Estratégia Saúde da Família (ESF)

Ocurrencia y caracterización de mareos en ancianos asistidos en una Estrategia de Salud Familiar (ESF)

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Abstract

Introduction: Dizziness is seen as one of the most common symptoms in the general population, occurring with a greater incidence in the elderly population, which frequently presents balance disorders and impaired vestibular systems. The characterization of a group of elderly people in the south central region of the Brazilian state of Paraná in relation to the occurrence of dizziness has its importance in order to enable a promotion of actions that aim an expanded care for this population by Primary Care. **Objective:** to characterize the relation between the dizziness complaints, their self-perception of the disabling effects, the self-report of medication use and the occurrence of falls in the elderly assisted by a Family Health Strategy team. **Method:** Seventy-five elderly people of both genders were asked about the presence of dizziness; those who reported it were submitted to the Dizziness Handicap Inventory (DHI) in the Brazilian version and a questionnaire to characterize the symptom. **Results:** In 75 elderly people questioned, 42 (56.00%) reported complaints of dizziness, the average age was 67.61 ± 5.68 years (mean \pm standard deviation), 25 (59.52%) being female and 17 (40.48%) were male. The mean total

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Authors' contributions:

JFA: study design, methodology, data collection and article outline.

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DHI score was 12.52 ± 6.80 points in the physical domain, 11.90 ± 7.93 points in the functional domain, 9.33 ± 8.25 points in the emotional domain and 33.67 ± 21.05 points in the total domain. **Conclusion:** Dizziness, characterized by moderate impact, of a non-rotating type, persisting for more than 12 months and associated with the use of polypharmaceuticals, was a frequent symptom in the elderly population of this study, especially in females. The self-perception of quality of life indicated a reduction in the physical domain, negatively impacting daily activities.

Keywords: Aging; Aged; Postural Balance; Dizziness; Family Health Strategy.

Resumo

Introdução: A tontura é vista como um dos sintomas mais comuns na população em geral, ocorrendo com maior incidência na população idosa que frequentemente apresenta distúrbios do equilíbrio e comprometimento do sistema vestibular. A caracterização de um grupo de idosos da região centro sul do estado do Paraná com relação à ocorrência de tontura tem sua importância a fim de viabilizar a promoção de ações que visem um cuidado ampliado a esta população por parte da Atenção Básica. **Objetivo:** caracterizar as relações da queixa de tontura, sua autopercepção dos efeitos incapacitantes, o auto relato de uso de medicamentos e ocorrência de quedas em idosos atendidos por uma equipe de Estratégia Saúde da Família. **Método:** Setenta e cinco idosos de ambos os sexos foram questionados sobre presença de tontura; os que a referiram, foram submetidos ao Dizziness Handicap Inventory (DHI) na versão brasileira e a um questionário para caracterização do sintoma. **Resultados:** Dos 75 idosos questionados, 42 (56,00%) relataram queixa de tontura, a média etária foi de $67,61 \pm 5,68$ anos (média \pm desvio padrão), sendo 25 (59,52%) do sexo feminino e 17 (40,48%) do masculino. O escore total médio do DHI foi de $12,52 \pm 6,80$ pontos no domínio físico, de $11,90 \pm 7,93$ pontos no domínio funcional, $9,33 \pm 8,25$ pontos no domínio emocional e $33,67 \pm 21,05$ pontos no domínio total. **Conclusão:** A tontura, caracterizada por impacto moderado, de tipo não rotatória, de persistência superior a 12 meses e associada com uso de polifármacos, foi um sintoma frequente na população idosa deste estudo, sobretudo no sexo feminino. A auto percepção de qualidade de vida indicou diminuição no domínio físico impactando negativamente nas atividades cotidianas.

Palavras-chave: Envelhecimento; Idoso; Equilíbrio Postural; Tontura; Estratégia Saúde da Família.

Resumen

Introducción: Se considera que los mareos son uno de los síntomas más comunes en la población en general, y se producen con mayor incidencia en la población de edad avanzada, que con frecuencia presenta trastornos del equilibrio y deterioro del sistema vestibular. La caracterización de un grupo de ancianos de la región centro-sur del estado de Paraná en relación con la aparición de mareos, tiene su importancia para permitir la promoción de acciones encaminadas a una atención prolongada de esta población por parte de la Atención Básica. **Objetivo:** Caracterizar las relaciones de la queja de mareo, su autopercepción de los efectos incapacitantes, la auto información sobre el uso de medicamentos y la ocurrencia de caídas en ancianos atendidos por un equipo de Estrategia de Salud Familiar. **Método:** Se interrogó a 75 hombres y mujeres de edad avanzada sobre la presencia de mareo; los que lo mencionaron fueron sometidos al Inventario de Discapacidades por Mareos (DHI) en la versión brasileña y a un cuestionario para caracterizar el síntoma. **Resultados:** De los 75 ancianos interrogados, 42 (56,00%) informaron de mareos, la edad media fue de $67,61 \pm 5,68$ años (media \pm desviación estándar), siendo 25 (59,52%) mujeres y 17 (40,48%) hombres. La media total de la puntuación del DHI fue de $12,52 \pm 6,80$ puntos en el dominio físico, $11,90 \pm 7,93$ puntos en el dominio funcional, $9,33 \pm 8,25$ puntos en el dominio emocional y $33,67 \pm 21,05$ puntos en el dominio total. **Conclusión:** El mareo, caracterizado por un impacto moderado, de tipo no rotacional, con persistencia superior a 12 meses y asociado al uso de poli farmacéuticos, fue un síntoma frecuente en la población de edad avanzada de este estudio, especialmente en las mujeres. La autopercepción de la calidad de vida indicaba una disminución del dominio físico, lo que afectaba negativamente a las actividades cotidianas.

Palabras clave: Envejecimiento; Anciano; Equilibrio postural; Mareos; Estrategia de Salud Familiar.

Introduction

Dizziness is one of the most common symptoms in the population at large, with higher incidence among the elderly population, who often suffers from balance disorders and impairment of the vestibular system. In the scope of the Unified Health System (Sistema Único de Saúde – SUS), in 2006, the National Health Care Policy for the Elderly (Política Nacional de Saúde da Pessoa Idosa - PNSPI) was created, aiming at ensuring comprehensive health care to the population over 60 years old, focusing on the healthy, active aging. Regarding the primary health care and the elderly health, the Family Health Strategy Program (Estratégia Saúde da Família - ESF) is the gateway for the health care system, where actions entailing promotion, prevention, diagnose, treatment and rehabilitation must occur. The Family Health Strategy Program delivers comprehensive health care in all life cycles¹.

Dizziness has been considered a geriatric syndrome, that is, a multifactorial health condition evolving from the cumulative deficits in multiple systems, attributed to more vulnerable elders². This symptom can be defined as a false sense of motion, a feeling of spatial disorientation or loss of body balance, which can be the rotational type (vertigo) or non-rotational type (instability, imbalance, floating, oscillopsia or oscillation)³.

The ability to keep posture and balance control is fundamental for one's life, and its decline causes great discomfort and insecurity, impairing locomotion and orientation⁴. Aging is straight correlated to the presence of multiple otoneurological symptoms related to body balance, such as hearing loss, tinnitus, gait disorders, vertigo, body balance disorders and occasional falls⁵.

The frequency of falls increases significantly with age-related biological changes, once muscle structure and function are altered, declining as the number and size of the muscle fibers decrease at the end of adult age. Older adults over 65 years of age experience falls at least once a year³, and they may occur due to several factors, leading to fractures, fear of falling and significant loss of functional independence⁶. Thus, the pharmacological therapy is the most commonly used method to treat that disorder⁷.

Regarding healthy aging among the elderly population, the concept of “quality of life” is

stressed in a subjective way, that is, its status depends on the individual perception and involves several dimensions. Within the scope of the old age, quality of life is related to the maintenance of the individual's autonomy, which can be perceived in the performance of daily activities in older adults who keep their functional capacity⁸.

Therefore, this study aims to characterize the relations of the dizziness complaint, the self-perception of its impairing effects, the self-report of the use of medication and the occurrence of falls among older adults treated by a team from the Family Health Strategy Program.

Method

The current research is a descriptive, analytical, crosscut study, approved by the Research Ethics Board under opinion number 2,648,047.

Seventy-five elders, who reported dizziness complaint, out of 420 elders registered in the Family Health Strategy Program, were submitted to the Brazilian version of the Dizziness Handicap Inventory (DHI), which assesses the self-perception of the impairing effects of dizziness. The questionnaire comprises 25 questions, subdivided in the assessment of physical, emotional and functional aspects. Regarding the questionnaire scoring, the answer “yes” scores four points, the answer “sometimes” scores two points, and for the answer “no”, the score is zero. The total score is 100 points, meaning the maximum handicap caused by dizziness, and the lowest score, zero points, unveils no dizziness handicap for the subject's life⁹.

Subsequently, they responded a questionnaire elaborated by the researcher, which objectified to characterize dizziness concerning its type, frequency, associated symptoms and outcomes. All participants signed the free, informed consent form.

Data were analyzed by means of the descriptive, inferential statistics. Statistica 13.0 was the software used to describe the mean, standard deviation, first quartile, median, third quartile, minimum and maximum of the dependent variables. In addition, Shapiro-Wilk test was used to show the non-normal distribution. The use of the Mann-Whitney test, the Two-Proportion test, and the Chi-square test were also required. To all the inferential analysis, the level of significance considered was 5% ($p \leq 0.05$).

Results

Seventy-five older adults participated in the current study, ages between 60 and 87, mean of 67.61 (± 5.68) years, among those, 41 (54.67%) were females, and 34 (45.33%) were males ($p=0.391$). Among those older subjects, 42 (56.00%) reported dizziness complaint, while 33 (44.00%) did not report it, without statistically significant difference between them ($p=0.305$).

Among the 42 older subjects who reported dizziness complaint, 25 (59.52%) were females, and 17 (40.48%) were males ($p=0.210$). The elders

who suffered from dizziness were between 60 and 83 (67.90 ± 5.50) years, and the onset of the symptoms ranged from 14 days to 15 years, median of three years.

Concerning the type of dizziness, there was significantly higher proportion of non-rotational dizziness ($p=0.003$). There was not statistical difference between the dizziness categories, with the subjective type the most frequent one for the rotational dizziness, reported by eight older subjects (72.73%), and among the non-rotational dizziness, the floating sensation and imbalance were reported by nine older subjects (29.03%) (Table 1).

Table 1. Descriptive analysis of the variables regarding the types of dizziness in older subjects with complaint of dizziness

Type of dizziness	N	%	p-value*
Rotational	11	26.19	0.00**
Non-rotational	31	73.81	

Legend: *Test for Equality of Two Proportions; n=number of subjects; %=percentage. ** $p \leq 0.05$

The prevalent intensity/severity of dizziness was moderate, reported by 17 (40.48%) elderly participants. Correlating the type of dizziness to the reported intensity, moderate intensity was more prevalent (48.39%) among the elders suffering from non-rotational dizziness, and severe intensity (63.64%) for the elders suffering from rotational dizziness, without statistically significant associa-

tion. Concerning the correlation between the type of dizziness and the duration of the symptoms, there was statistically significant correlation ($p=0.004$). Rotational dizziness featured more frequency of crises, lasting seconds, followed by minutes, while the non-rotational dizziness featured more frequency of crises lasting minutes, followed by hours (Table 2).

Table 2. Association between intensity/severity and duration of the symptoms and the type of dizziness reported by the older adults (n=42)

		Type of dizziness		p-value*
		Rotational dizziness (n=11)	Non-rotational dizziness (n=31)	
Intensity				
Mild	N (%)	2 (18.18%)	8 (25.81%)	0.07**
Moderate	N (%)	2 (18.18%)	15 (48.39%)	
Severe	N (%)	7 (63.64%)	8 (25.81%)	
Duration				
Seconds	N (%)	6 (54.55%)	2 (6.45%)	0.00**
Minutes	N (%)	4 (36.36%)	15 (48.39%)	
Hours	N (%)	1 (9.09%)	12 (38.71%)	
Days	N (%)	0 (0.00%)	2 (6.45%)	

Legend: *Chi-squareTest; n=number of subjects; %=percentage. ** $p \leq 0.05$

Among the 42 older adults with dizziness complaint, 18 (42.86%) reported one to five episodes of falls, an average of 2.17 falls per older subject, with 11 (26.19%) out of 42 older adults reporting at least one fall in the past year (Table 3), with greater proportion of falls with recoverable injuries (Table 4).

Table 3. Descriptive analysis of the variables total of falls and falls in the past year in older adults with dizziness complaint

Variable	N	MEAN	SD	Q25	MEDIAN	Q75	MINIMUM	MAXIMUM
Total of falls	18	2.17	1.20	1.00	2.00	5.00	1.00	5.00
Falls in the past year	11	0.89	0.76	0.00	1.00	2.00	1.00	2.00

Legend: n=number of subjects; SD=standard deviation; Q25=first quartile

Table 4. Descriptive analysis of the varied outcomes of falls in older adults (n=18)

Outcomes	N	%	p-value*
No injuries	5	27.78	0.700**
Permanent injuries (fractures)	6	33.33	0.827**
Recoverable injuries (abrasions/sprains)	7	38.89	Ref.

Legend: *Test for Equality of Two Proportions; n=number of subjects; %=percentage. **p≤0.05

A similar number of participants, who used and did not use dizziness medication, was observed (n=21; 50%)

In the description of the Brazilian DHI for the functional, physical and emotional domains, as well as the total, in the assessed sample, the physical domain was the most affected.

Table 5. Descriptive analysis of the variables: use of medication and medication for dizziness in older adults with dizziness complaint

Number of medication	N	%	p-value*
0	17	40.4	
1 or 2	18	42.9	
3 or 4	5	11.9	
5 or more	2	4.8	
Medication for dizziness	N	%	
Yes	21	50.00	0.500**
No	21	50.00	

Legend: *Test for the Equality of Two Proportions; n=number of subjects; %=percentage. **p≤0.05

Table 6. Descriptive analysis of the variables of the Dizziness Handicap Inventory (DHI) domains in older adults with dizziness complaint

DHI	N	MEAN	SD	Q25	MEDIAN	Q75	MINIMUM	MAXIMUM
Physical	42	12.52	6.80	8.00	12.00	16.00	0.00	28.00
Functional	42	11.90	7.93	6.00	8.00	18.00	0.00	30.00
Emotional	42	9.33	8.25	2.00	7.00	14.00	0.00	26.00
Total	42	33.67	21.05	20.00	24.00	48.00	0.00	82.00

Table 7 shows statistically significant difference in the total scoring of the DHI (47.09) in all the domains for the type of dizziness. Participants

with rotational dizziness featured significantly higher scores than participants with non-rotational dizziness.

Table 7. Analysis of the domain scores of the Dizziness Handicap Inventory (DHI) regarding the type of dizziness in older adults with dizziness complaint

DHI	TYPE OF DIZZINESS	MEAN	SD	Q25	MEDIAN	Q75	P-VALUE*
Physical	Rotational	15.82	6.84	12.00	16.00	20.00	0.05**
	Non-rotational	11.35	6.50	8.00	12.00	14.00	
Functional	Rotational	16.91	8.02	12.00	16.00	24.00	0.01**
	Non-rotational	10.13	7.21	6.00	8.00	12.00	
Emotional	Rotational	14.36	7.89	8.00	12.00	24.00	0.01**
	Non-rotational	7.55	7.72	2.00	4.00	14.00	
Total	Rotational	47.09	20.50	24.00	48.00	60.00	0.01**
	Non-rotational	28.90	19.40	18.00	22.00	38.00	

Legend: *Mann-Whitney test; n=number; SD=standard deviation; Q25=first quartile; Q75=third quartile. **p<0.05

Discussion

The prevalence of dizziness was 56.00% among the studied population. Among the Brazilian elderly population, the estimated rate is 45.00%¹⁰, assumption confirmed by a study held with 493 non-institutionalized older subjects, registered in Primary Health Care Units, similarly to what was found in population of the Family Health Strategy Program, which evidenced dizziness prevalence of 52.1%¹¹. It is superior to the European prevalence, which is 14.4%¹².

Greater prevalence of dizziness complaint occurred among females (59.52%), which was reported in an epidemiological study with Brazilian (71.6%)⁹ and European (67.00%) populations¹², a fact that can be explained by the hormone changes occurring in women, which may affect the vestibular system functioning, thus resulting in balance disorders^{13,14,15}.

The symptom onset ranged from 14 days to 15 years, median of three years, which corroborates a study, in which most elders (68.7%) reported the duration of the condition superior to one year, and among them, 24.4% suffered from dizziness for over 5 years¹⁰.

The length of time living with dizziness is a factor of concern, due to its correlation to the occurrence of falls. That was evidenced in an epidemiological study, which objectified to determine the prevalence of dizziness in the adult population, and 54.00% of the respondents reported dizziness.

It was slightly lower among the population with 65 years (39.00%)¹⁶, but equally worrying.

Concerning the type of dizziness, the most frequent was the non-rotational type (73,81%), that is, imbalance and floating sensation (29.03% each), agreeing with a study which observed greater prevalence of non-rotational dizziness (62%), being the floating type the most frequent (28%) among individuals aged over 65¹⁶. However, those findings are not in conformity with a study held, in which rotational dizziness was more prevalent, reported by 29 (51.8%) participants¹⁵.

In general, the older subjects reported greater occurrence of moderate dizziness (40.48%), according to the DHI severity grading. That was the most reported intensity grading (37.1%) in a study conducted with 27 individuals, ages between 17 and 78 (29% of elders)¹⁴. By analyzing the severity grading of dizziness, among those who reported non-rotational and rotational dizziness in the current study, moderate (48.39%) and severe (63.64%) grades were the most prevalent, respectively. In the literature, reports of the severity/intensity grading of dizziness, according to its type, were not found to enable any comparison.

There was statistically significant relation (p=0.004) between the type and frequency, with the rotational dizziness featuring higher frequency of crises, lasting for seconds, corroborating study, which verified that most elders (48.6%) from that primary health care unit reported the duration of the symptom in seconds¹⁷.

Eighteen (42.86%) older adults reported one to five episodes of falls, averaging 2.17 falls per subject, corroborating study that observed 44.6% of falls, with an average of 4.6 falls; thus, a higher rate than in the current study¹⁵. Another study, held in the urban area of a city in Southern Brazil, observed that 28.1% of the older subjects reported at least one fall in the preceding year¹⁸. The analysis of the number of falls, in the preceding year, in elders with complaint of dizziness, evidenced higher occurrence of cases when comparing to the current study, in which 43.30% of them reported falls. In addition, in another study, 38.7% reported falls, while in the current study, 26.19% reported falls¹⁹.

The most frequent outcome among elderly subjects, who reported at least one episode of falls, was recoverable injuries (38.89%), followed by permanent injuries (33.33%), and the absence of injuries (27.78%). That was in conformity with a study that found 358 (92.03%) reports of falls, most of them (n=248; 63.74%) featuring recoverable injuries (summing abrasion and sprain cases), 113 (29.05%) featuring permanent injuries (fractures), and 28 (7.20%) did not report any injuries²¹. Additionally, other studies found similar results in the order of presentation of their results, but the proportions differed. Even though there are no physical injuries, falls may cause other outcomes, such as insecurity, fear and depression, hindering the social relations²².

On the other hand, the absence of physical injuries may cause the neglect of other conditions, avoiding medical visits and treatment, consequently increasing the propensity to falls.

Concerning the use of medication, 17 (40.4%) older subjects did not make use of it, 18 (42.9%) used one or two types, five (11.9%) made use of three or four types of medication, and two of them (4.8%) used five or more types of medication, corroborating earlier research²³. However, it differs from a study, in which higher prevalence (9.8%) of elders made use of five or more types of medication²⁴, and still disagreeing with another study, which found that 19, out of 50 older adults, with complaint of dizziness, made use of three or more types of medication¹⁷.

Half of the elderly participants (50.0%) in the current research made use of medication to reduce the dizziness symptoms. Nevertheless, according to a study conducted with 51 adult and older individuals, ages between 20 and 83 (56.1 ± 14.4), the

use of dizziness related-medication is not always considered efficient, as data found, while comparing two groups making use and not making use of medication, no improvement in their quality of life, even evidencing worse postural balance among the users of dizziness medication²⁵.

The most commonly used method for the treatment of vestibulopathies is the pharmacological therapy²⁵. Fighting the cause of dizziness, associated to the vestibular rehabilitation, may bring about significant results, once the central compensation does not only occur with the pharmacological treatment. Frequently, it may only provide symptom relief, and its inadequate use may worsen the symptoms, or even delay central compensation, when used for prolonged time²⁶.

The results of the DHI showed mean total scoring of $33.67 (\pm 21.05)$ points. The most impaired aspect was the physical one, followed by the functional and emotional aspects. However, such results are not in conformity with a study conducted with 56 elderly subjects reporting dizziness complaint, in which total scoring was $51.0 (\pm 20.9)$ points, and the functional aspect was the most impaired, followed by the physical and emotional aspects¹⁵.

The physical aspect refers to the relation between the onset, triggering or worsening of the dizziness symptom and the movement of eyes, head and body. The functional aspect focus on the ability to perform household, social, leisure, professional tasks, as well as the independence for some daily activities, such as walking without any support, and walking around the house in the dark. The differences between the physical and functional aspects can be explained by means of each population's lifestyle. The most impaired aspect in the current research is explained by the fact that the elderly are more active and independent, without restraining their activities of daily living, with a quieter lifestyle when compared to elders living in São Paulo/Brazil, assumedly a more hectic place, consequently affecting their independence, once they are in a society where more social participation is required.

Still in relation to the DHI, it was possible to observe in this study that older subjects with rotational dizziness evidence worse quality of life than elders suffering from non-rotational dizziness, featuring statistically significant difference in the total score of the DHI, and in all domains. Those data differ from a study, in which no statistically

significant relation was found in the DHI total score, or in any domains, when comparing elders with rotational and non-rotational dizziness¹⁵.

Conclusion

Dizziness, characterized by a moderate impact, non-rotational type, length of time superior to 12 months and associated to the use of multiple medication, was a frequent symptom in the elderly population in this study, particularly in females. The self-perceived quality of life pointed to the decline in the physical domain, negatively affecting the activities of daily living.

References

1. Queiroz EPS, Carvalho RN, Cavalcanti PB, Araújo AP. Grupo de idosos e estratégia saúde da família: práticas educativas na promoção do envelhecimento saudável. TEMA-Revista Eletrônica de Ciências [Internet]. 2014 [acesso em 2020 abr 23]; 15(22/23); 17-32. Disponível em: <http://revistatema.facisa.edu.br/index.php/revistatema/article/view/250>
2. Tinetti ME, Williams CS, Gill TM. Dizziness among older adults: a possible geriatric syndrome. *Ann Intern Med*. 2000;132(5): 337-44.
3. Rodrigues EF, de Souza DGR, Gazzola JM. Quedas no idoso com tontura. *Revista Equilíbrio Corporal e Saúde* [Internet]. 2011 [acesso em 2020 abr 23]; 3(2): 40-4. Disponível em: <https://revista.pgskroton.com/index.php/RECES/article/view/139>
4. Bittar RSM, Pedalini MEB, Ramalho JO, Yoshimura R. Análise crítica dos resultados da reabilitação vestibular em relação à etiologia da tontura. *Rev Bras Otorrinolaringol* [Internet]. 2007 [acesso em 2020 abr 23]; 73(6): 760-4. Disponível em: http://www.scielo.br/scielo.php?pid=S0034-7292007000600007&script=sci_arttext
5. Ganança FF, Gazzola JM, Ganança CF, Caovilla HH, Ganança MM, Cruz OLM. Quedas em idosos com vertigem posicional paroxística benigna. *Braz J Otorhinolaryngol* [Internet]. 2010 [acesso em 2020 abr 23]; 76(1): 113-20. Disponível em: http://www.scielo.br/scielo.php?pid=S1808-86942010000100019&script=sci_arttext
6. Gazzola JM, Ganança FF, Perracini MR, Aratani MC, Dorigueto RS, Gomes CMC. O envelhecimento e o sistema vestibular. *FisioterMov* [Internet]. 2017 [acesso em 2020 abr 23]; 18(3): 39-48. Disponível em: <https://periodicos.pucpr.br/index.php/fisio/article/viewFile/18600/18036>
7. Aiolfi CR, Alvarenga MRM, Moura CDS, Renovato RD. Adesão ao uso de medicamentos entre idosos hipertensos. *Rev Bras GeriatrGerontol* [Internet]. 2015 [acesso em 2020 abr 23]; 18(2): 397-404. Disponível em: http://www.scielo.br/scielo.php?pid=S1809-98232015000200397&script=sci_arttext
8. Toldrá RC, Cordone RG, Arruda BDA, Souto ACF. Promoção da saúde e da qualidade de vida com idosos por meio de práticas corporais. *Mundo Saúde* [Internet]. 2014 [acesso em 2020 abr 23]; 38(2): 159-68. Disponível em: http://www.saocamilos-p.br/pdf/mundo_saude/155562/A04.pdf
9. Melo Neto JSD, Stroppa AEZ, Parrera CA, Maximiano WF, Hidalgo CA; Reabilitação vestibular em portadores de vertigem posicional paroxística benigna. *Rev CEFAC* [Internet]. 2013 [acesso em 2020 abr 23]; 15(3): 510-20. Disponível em: http://www.scielo.br/scielo.php?pid=S1516-18462012005000064&script=sci_arttext&tlng=pt
10. de Moraes SA; Soares WJS, Rodrigues RAS, Fett WCR, Ferrioli E, Perracini MR. Dizziness in community-dwelling older adults: a population-based study. *Braz J Otorhinolaryngol* [Internet]. 2011 [acesso em 2020 abr 23]; 77(6): 691-9. Disponível em: www.scielo.br/scielo.php?script=sci_arttext&pid=S1808-86942011000600003&lng=pt&nrm=iso&tlng=en
11. Lopes AR, Moreira MD, Trelhas CS, Marchiori LLM. Association between complaints of dizziness and hypertension in non-institutionalized elders. *Int Arch Otorhinolaryngol* [Internet]. 2013 [acesso em 2020 abr 23]; 17(2): 157-62. Disponível em: http://arquivosdeorl.org.br/additional/acervo_eng.asp?id=1348
12. Penger M, Strobl R, Grill E. Country-specific and individual determinants of dizziness in Europe: results from the Survey of Health Ageing and Retirement in Europe (SHARE). *Public Health*. 2017; 149: 1-10.
13. Castro ASOD; Gazzola JM, Natour J, Ganança FF. Versão brasileira do Dizziness Handicap Inventory. *Pró-Fono R Atual Cient* [Internet]. 2007 [acesso em 2020 abr 23]; 19(1): 97-104. Disponível em: http://www.scielo.br/scielo.php?pid=S0104-56872007000100011&script=sci_arttext
14. Moreira DA, Bohlsen YA, Momensohn-Santos TM, Cherubini AA. Study of the Handicap Caused by Dizziness in Patients Associated or Not with Tinnitus Complaint. *Int Arch Otorhinolaryngol* [Internet]. 2006 [acesso em 2020 abr 23]; 10(4): 270-7. Disponível em: <http://www.arquivosdeorl.org.br/conteudo/pdfForl/389.pdf>
15. Scherer S, Lisboa HRK, Pasqualotti A. Tontura em idosos: diagnóstico otoneurológico e interferência na qualidade de vida. *Revi Soc Bras Fonoaudiol* [Internet]. 2012 [acesso em 2020 abr 23]; 17(2): 142-50. Disponível em: http://www.scielo.br/scielo.php?pid=S1516-80342012000200007&script=sci_arttext
16. Bittar RSM, Oiticica J, Bottino MA, Ganança FF, Dimitrov R. Population epidemiological study on the prevalence of dizziness in the city of São Paulo. *Braz J Otorhinolaryngol* [Internet]. 2013 [acesso em 2020 abr 23]; 79(6): 688-98. Disponível em: http://oldfiles.bjorl.org/conteudo/acervo/acervo_english.asp?id=4520
17. Ferreira LMDBM, Ribeiro KMOBD, Pestana ALDS, Lima KCD. Prevalência de tontura na terceira idade. *Rev CEFAC* [Internet]. 2014 [acesso em 2020 abr 23]; 16(3): 739-46. Disponível em: http://www.scielo.br/scielo.php?pid=S1516-18462014000300739&script=sci_arttext
18. Vieira LS, Gomes AP, Bierhals IO, Farias-Antúnez S, Ribeiro CG, Miranda VIA, Lutz BH, Barbosa-Silva TB, Lima NP, Bertoldi AD, Tomasi E. Quedas em idosos no Sul do Brasil: prevalência e determinantes. *Rev Saude Publica* [Internet]. 2018 [acesso em 2020 abr 23]; 52: 22. Disponível em: http://www.rsp.fsp.usp.br/wp-content/uploads/articles_xml/0034-8910-rsp-S1518-87872018052000103/0034-8910-rsp-S1518-87872018052000103-pt.x63890.pdf



19. Matias LTL. Avaliação da marcha e risco de quedas em idosos com queixa de tontura em atendimento ambulatorial [monografia na Internet]. Natal (RN): Universidade Federal do Rio Grande do Norte - UFRN; 2017 [acesso em 2020 abr 23]. Disponível em:[https://monografias.ufrn.br/jspui/bitstream/123456789/5361/3/Avalia%
c3%a7%e3%a3omar charisco_2017_Trabalho%20de%20Conclus%
c3%a3o%20de%20Curso](https://monografias.ufrn.br/jspui/bitstream/123456789/5361/3/Avalia%c3%a7%e3%a3omar charisco_2017_Trabalho%20de%20Conclus%c3%a3o%20de%20Curso)
20. Campos MPS, Viana LG, Campos AR. Os testes de equilíbrio Alcance Funcional e “Timed Up and Go” e o risco de quedas em idosos. *RevKairos* [Internet]. 2013 [acesso em 2020 abr 23]; 16(4): 125-38. Disponível em:<https://revistas.pucsp.br/kairos/article/view/19633>
21. Ferretti F, Lunardi D, Bruschi L. Causes and consequences of fall among elderly people at home. *FisioterMov* [Internet]. 2013 [acesso em 2020 abr 23]; 26(4): 753-62. Disponível em:http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-51502013000400005&lng=en&nrm=iso&tlng=en
22. Caveiro RR, Peluso EDTP, Branco-Barreiro FCA. Depressão em idosos com tontura crônica e sua relação com desequilíbrio e impacto da tontura na qualidade de vida. *Revista Equilíbrio Corporal e Saúde* [Internet]. 2013 [acesso em 2020 abr 23]; 5(2): 25-34. Disponível em:<https://revista.pgsskroton.com/index.php/reces/article/view/10>
23. Ricci NA, Gonçalves DDF, Coimbra IB, Coimbra AMV. Fatores associados ao histórico de quedas de idosos assistidos pelo programa de saúde da família. *Saúde Soc* [internet] 2010 [acesso em 2020 abr 23]; 19(4) 898-909. Disponível em:http://www.scielo.br/scielo.php?pid=S0104-12902010000400016&script=sci_arttext&tlng=pt
24. Rodrigues IG, Fraga GP, Barros MBDA. Quedas em idosos: fatores associados em estudo de base populacional. *RevBrasEpidemiol*[Internet]. 2014 [acesso em 2020 abr 23]; 17(3): 705-18. Disponível em:http://www.scielo.br/scielo.php?pid=S1415-790X2014000300705&script=sci_arttext&tlng=pt
25. Tsukamoto HF, Costa VDSP, Silva Júnior RAD, Pelosi GG, Marchiori LLD, Fernandes KBP. Influência do tratamento com fármacos antivertiginosos sobre o equilíbrio postural e qualidade de vida de indivíduos com queixa de tontura. *Rev CEFAC* [Internet]. 2015 [acesso em 2020 abr 23]; 17(5): 1394-402. Disponível em:http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1516-18462015000501394
26. Eleftheriadou A, Skalidi N, Velegrakis GA. Vestibular rehabilitation strategies and factors that affect the outcome. *EurArchOtorhinolaryngol*. 2012; 269(11): 2309-16.

