



ASSESSMENT OF MOBILITY AND RISK FACTORS FOR FALLS AMONG ELDERLY INDIVIDUALS

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ABSTRACT

Objective: To assess functional mobility and risk factors for falls among elderly individuals cared for in a Primary Health Care center. **Method:** this descriptive, field study with a quantitative approach was conducted in a Primary Health Care center with a sample of 197 elderly individuals. A form was used to address the participants' social and health characteristics, and intrinsic, extrinsic, and behavioral factors that trigger falls, along with a functional mobility test. Descriptive and inferential statistical methods were used: D'Agostino-Pearson test, Chi-square(10), Student's t-test, and Analysis of Variance (ANOVA). **Results:** Most participants presented incomplete middle school (65.5%), were married (45.7%), resided with one child (54.8%), watched TV for leisure (47.2%), presented moderate self-perceived health (46.7%), and were women (70.1%). The factors related to a greater likelihood of falls are having a fracture, dislocation, or difficulty walking, inadequate lighting at home, and taking five or more medications. **Conclusion:** The results show that the elderly participants are at the risk of falling; however, the youngest still present appropriate functional mobility.

Keywords: Aged. Postural Balance. Primary Health Care.

INTRODUCTION

Trauma is considered a public health problem and is the fifth leading cause of death in the elderly, with almost 14,000 deaths/day. Physical trauma such as falls, burns, and traffic accidents (run over or collisions) are the most frequent. Among the factors predisposing to falls, the following stand out: immobility or functional disability to perform activities of daily living, decreased muscle strength, dizziness, and chronic diseases⁽¹⁾.

The consequences of falls with trauma include a potential decline in a function or the onset of a new disease, with disastrous and striking outcomes⁽²⁾. Falls are considered the primary cause of accidents among elderly individuals, impairing their health, being one of the main reasons these individuals are admitted in emergency services, and a factor that triggers institutionalization⁽³⁾. The prevalence of falls

among the elderly in Brazil is 32.1%. Post-fall injuries are the 6th leading cause of death among 65-year-old or older individuals⁽⁴⁾. A total of 70% of the deaths are related to falls among individuals 75+ years old⁽⁵⁾.

Elderly individuals are more susceptible to problems such as morphological, functional, and biochemical changes. With aging, the organism goes through changes and becomes exposed to intrinsic, extrinsic, and behavioral factors, to factors present in the individuals' environment, the individuals' perception regarding their physical environment, and reckless behavior^(5,6).

The functional balance of elderly individuals is an essential factor in keeping their autonomy, considering the aging process and functional changes. Therefore, assessing balance and functional mobility is essential to implement interventions intended to prevent falls⁽⁷⁾. Identifying risk factors within the Primary

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Health Care (PHC) sphere is essential to establish strategies to promote elderly individuals' health and support their families by enabling greater independence, autonomy, and safety to perform activities of daily living⁽⁸⁾. Given the previous discussion, this study's objective is to assess functional mobility and risk factors for falls among elderly individuals cared for by a PHC center.

METHOD

This descriptive, field study, with a quantitative approach, was performed in a PHC center located in the administrative district of Benguí, Belém, PA, Brazil. The total population was composed of 396 elderly individuals, and the sample was determined by a probabilistic method with a significance level at 5% and confidence level at 95% for the sampling error, resulting in a sample of 197 elderly individuals. Inclusion criteria were being 60 years old or older, both sexes, and being registered in the PHC unit. Exclusion criteria were being unable to walk, having vestibular disorders, blindness, or other disorders that impeded the individual from taking the test. The authors developed a semi-structured interview to collect data. The interview script consisted of two stages. The first stage, intended to characterize the participants' social profile, addressed the participants' level of education, marital status, with whom they resided with, leisure, and self-perception of health. The second stage, intended to identify intrinsic, extrinsic, and behavior factors that trigger falls, was performed using the functional mobility test Timed Up & Go (TUG). Data were collected from August to October 2018.

Descriptive and inferential statistical methods were used. The qualitative variables were presented using absolute and relative frequencies. The quantitative variables were presented using central tendency and variation measures. The normality of the quantitative variables was assessed using the D'Agostino-Pearson Test. The distribution of the qualitative variables was assessed using the Chi-square test. The quantitative variables were compared using the Student's t-test and ANOVA (Analysis of Variance). The significance level was established at $\alpha=0.05$ (alpha error margin of 5%) to reject the null hypothesis. Data analysis was planned using dEASygn version 3.0, and BioEstat version 5.3 was used in the statistical processing. In accordance to the ethical principles established by Resolution 466/2012 CNS/MS8, the participants received clarification regarding the study's objectives and signed free and informed consent forms. The Institutional Review Board at the *Faculdade Metropolitana da Amazônia* approved the project (Opinion report No. 3,067,316).

RESULTS

Characterization of the participants' social and health aspects

The elderly individuals were characterized by the following tendencies considered statistically significant: incomplete primary school (65.5%), married (45.7%), resided with son/daughter (54.8%), spent leisure time watching TV (47.2%), and presented moderate self-perceived health (46.7%) (Table 1).

Table 1. Characterization of the sample n=197 elderly individuals. Belém, PA, Brazil 2018.

Characteristic	N	%	p-value
Education			0.0001*
Illiterate	10	5.1	
Incomplete middle school	129	65.5	
Middle school	28	14.2	
High school	24	12.2	
Incomplete high school	5	2.5	
Higher Education	1	0.5	
Marital Status			0.0002*
Married	90	45.7	
Divorced	12	6.1	
Others	3	1.5	
Single	50	25.4	
Widowed	42	21.3	

To be continued...

Reside with		<0.0001*
Spouse	91	46.2
Friend	1	0.5
Nephew	2	1.0
Son or daughter-in-law	12	6.1
Son/daughter	108	54.8
Alone	29	14.7
Leisure		0.0001*
Going out	79	40.1
Receive visits	34	17.3
TV	93	47.2
Other	60	30.5
Self-perception of health		0.0002*
Excellent	5	2.5
Good	75	38.1
Regular	92	46.7
Poor	23	11.7
Very poor	2	1.0

*Chi-square adhesive.

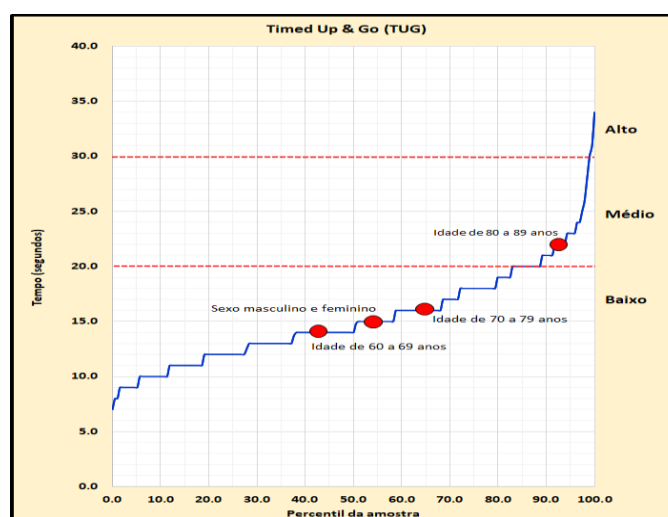
Source: Study's data, 2018.

Participants' characterization and TUG results according to sex and age

This study presents data from n=197 elderly individuals: 70.1% (138 individuals) were women, and 29.9% (59 individuals) were men. Age ranged from 60 to 87 years old, with an average of 68 years old and a standard deviation of 7.5 years. The most frequent age range was 60 to 69 years old, with 61.4% (121 individuals). The TUG test presented a mean of 15.5 seconds

and a standard deviation of 5.6 seconds. Graph 1 shows that most participants performed the test in less than 20 seconds; that is, low risk of falling. The test shows that those aged between 80 and 87 years old are more likely to fall (TUG=21.9 s), p-value<0.0001* (highly significant). On the other hand, no differences were found between individuals aged between 60 and 69 years old (TUG=14 s) and between 70 and 79 years old (TUG=16s).

Graph 1 –Distribution of the results obtained in the TUG test by n=197 elderly individuals, according to age and sex. Belém, PA, Brazil 2018.



Graph translation: Time (seconds); High; Moderate; Low; Same percentile ; Age from 80 to 89 years old; Age from 70; to 79 years old; Age from 60 to 69 years old; Sex male and female

Source: Study's results, 2018.

Intrinsic, Extrinsic and Behavioral Factors and Correlation with the TUG Results

Table 2 presents a comparison of the TUG test results using ANOVA (Analysis of Variance).

Regarding the intrinsic factors, the individuals with fractures, dislocation, or difficulty walking were more likely to fall (p -value<0.0001*, highly significant). Elderly individuals with a previous fall, two or more falls, hematoma, Diabetes Mellitus, problems to perform activities of daily living (ADL)/bathing, or other ADL (e.g., dressing, going to toilet, transfer, continence, feeding), or presented some hearing impairment, presented a moderate risk of falling. Only one participant presented a high risk of falling: hospitalization (TUG=31 s).

Regarding extrinsic factors, the elderly individuals whose homes were inadequately lighted were more likely to fall (p -value=0.0221*, highly significant), presenting a moderate risk of falling. As for behavioral factors, the individuals taking five or more medications were more likely to fall (p -value=0.0308*, highly significant), however, the mean these individuals obtained in the TUG test was below 20 s, which corresponds to low risk of falling.

Table 2. Intrinsic, Extrinsic and Behavioral Factors of n=197 elderly individuals. Belém, PA, Brazil 2018.

FACTOR	N	%	TUG Mean	SD
INTRINSIC FACTORS				
Problem – Hospitalization	1	0.5	31	0
Problem – Fracture	3	1.5	22.3	11
Problem – Dislocation	3	1.5	20.7	11.7
Walking problems	58	29.4	20.1	5.3
Hearing impairment	46	23.4	17.2	5.9
2 or more falls	12	6.1	17.9	7.8
Problem – Pain	48	24.4	16.7	5.6
Problem – Hematoma	18	9.1	16.8	4.3
Difficult performing other ADL	56	28.4	16.9	5.3
Previous fall	58	29.4	16.8	5.5
Difficult –ADL/bathing	11	5.6	16.8	6.7
Pathology – Diabetes	64	32.5	16.8	4.8
Vision impairment	125	63.5	15.2	4.8
Pathology – Hypertension	123	62.4	15.1	4.7
Pathology– Other	30	15.2	15.2	5.2
Pathology– Osteoporosis	28	14.2	15.3	5.3
Orientation	194	98.5	15.3	4.5
Pathology– Cancer	1	0.5	13	0
EXTRINSIC FACTORS				
Inadequate lighting	7	3.6	19.9	7.8
Home – doorframe	50	25.4	16.8	4.7
Difficulty – inappropriate shoes	56	28.4	16.3	5.5
Home - loose parquet flooring	4	2	16.2	4.6
Home - cement flooring	37	18.8	16.1	4.9
Medication use	155	78.7	16.5	4.6
Home – Pets	103	52.3	16.4	4.9
Home –smooth floor	156	79.2	16.4	4.3
Home – Rugs	94	47.7	14.5	3.9
Handrail in corridors	13	6.6	14.4	4.3
Home – Stairs	35	17.8	14.4	3.4
BEHAVIORAL FACTORS				
5 or more medications	18	9.1	18.8	5.1
Smoking	13	6.6	16.2	6.7
Waking up at night	146	74.1	15.9	4.6
Domestic chores	181	91.9	15.9	4.5
Bumpy streets	184	93.4	15.7	4.4
Climbing stairs/chairs	115	58.4	14.7	4
Physical exercise	75	38.1	14.6	4
Alcohol consumption	26	13.2	14.2	3.8

* p -value<0.0001, ANOVA with Tukey post test

Source: Study's data, 2018.

DISCUSSION

Over time elderly individuals become increasingly vulnerable to falls. This

vulnerability may be linked to poor education and low economic level, considering that low income, poor education, lack of social support, and lifestyle may intensify vulnerabilities,

making elderly individuals more susceptible to falls⁽⁹⁾.

The low educational level found in this study is considered an important predisposing factor. These individuals may experience greater impairment that prevents them from performing activities of daily living, considering they have difficulties understanding measures intended to prevent falls; the higher the educational level, the greater one's ability to understand orientations concerning self-care. These individuals seek health care services, which in turn, support the prevention of falls⁽¹⁰⁾.

Family co-residency has been a source of discussion regarding the importance of supporting elderly individuals. Family support is vital in the lives of elderly individuals to meet their needs, often reflecting social and economic needs. Adult children are often caregivers, helping elderly individuals to perform daily tasks, and solving social and financial problems. Usually, the closest child assumes this role and provides concrete support, promoting a sense of security⁽¹¹⁾.

This study shows that most of the participants usually spend their leisure time watching TV. Options of leisure tend to decrease with advanced age due to the various factors interfering in these practices such as social and economic conditions, lack of energy, low educational level, or visual/hearing impairments. Leisure activities among elderly individuals with limited mobility usually take place at home, such as watching TV or receiving visits. Individuals with higher mobility levels perform leisure activities outside the home⁽¹²⁾.

According to the literature, self-assessment is an instrument intended to improve the health condition and access of elderly individuals to health services. The participants addressed in this study presented a negative self-perception of health. Health encompasses physical, cognitive, and emotional aspects. Poor health is considered a predictor of functional disability. It reflects feelings of frailty and insecurity, thus, becoming an important indicator of mortality, contrasting with individuals who report excellent health, relating self-perception with the actual or objective health condition⁽¹³⁾.

The feminization of old age was found in this study in which most participants were women.

This is worth noting because it is a factor that influences the risk of falling⁽¹⁴⁾. Physiologically, women's bone mass decreases more rapidly than among men, due to decreased estrogen levels, making women more vulnerable to unwanted events. These risks are increased when there is a combination of factors such as eating disorders, morbidities, and sadness⁽¹⁵⁾.

Most participants were aged between 60 and 69 years old, an age range that is considered to be young, however, already presents risk factors. Advanced aging is the leading factor for the risk of falling; thus, it is essential to devise strategies to prevent adverse events⁽⁸⁾.

The mean obtained in the TUG test was 15.5 s, which corresponds to a low risk of falling. However, when these results were correlated with age, the participants between 80 and 87 years old presented a higher likelihood of falling. Falls may increase ten times the risk of death among octogenarian women⁽¹⁶⁾.

As for intrinsic factors, elderly individuals with fractures, dislocations, or difficulty walking are more likely to fall. The main intrinsic factors among individuals with a previous fall include difficulty walking, change of balance, and dizziness⁽¹⁷⁾. Having a fracture caused by a fall may lead to hospitalization and bronchoaspiration due to vomiting caused by intense pain immediately after the fall, resulting in being immobilized for an indefinite time, which in turn, increases vulnerability⁽¹⁸⁾.

Intrinsic factors aggravate the health of elderly individuals because they directly influence their functional performance due to the use of medications, poor visual or auditory acuity, abnormal gait and balance, functional decline, awkward movements, or syncope⁽¹⁴⁾.

As for the extrinsic factors, elderly individuals with inadequate lighting at home are more likely to fall. It seems that most accidents due to falls occur at home, caused by lowlighting, the height of bedrooms, lack of security bars in bathrooms, or slippery or uneven floors⁽¹⁹⁾.

Regarding behavioral factors, the elderly individuals taking five or more medications are also more likely to fall, though, these individuals obtained a mean below 20 s in the TUG test, which indicates a low risk of falling. This information shows that the behavioral factor and the use of medications may increase the

likelihood of falling compared to other factors; however, the participants addressed in this study presented a TUG result within normal parameters. This may be related to the participants' age range, which is considered young.

People tend to present more non-communicable chronic diseases in old age, and consequently, take multiple medications. These medications may decrease alertness and psychomotor functions due to inappropriate dosage, adverse effects, or medication interaction, resulting in muscle weakness, dizziness, arrhythmias, or postural hypotension, leading to falls⁽²⁰⁾.

Assessing mobility and the factors that influence falls among elderly individuals is important to support clinical practice and recognize the weaknesses leading to these incidents, as well as to devise strategies to identify and intervene on these factors timely to impede or minimize falls and favor healthy aging, preserving the autonomy and independence of these individuals with quality of life.

FINAL CONSIDERATIONS

This study's findings show that the risk of

falls among elderly individuals is associated with being a woman, low educational level, being married, residing with son/daughter, spending leisure time watching TV, and presenting a moderate health self-perception. The intrinsic, extrinsic, and behavioral risk factors mainly include having a fracture, dislocation, or difficulty walking; inadequate lighting; and polypharmacy, respectively. Even though the functional mobility test results were negative for the risk of falling, older elderly individuals are more likely to fall.

The results show that the elderly participants are at the risk of falling; however, the youngest still present appropriate functional mobility. This study's limitations include the number of participants and the impossibility to make comparisons between functional mobility and risk factors because the study was not conducted in other facilities, though, the findings can support other studies in the future.

It is essential to reflect upon the importance of this subject because even though it is a widely known problem, actions have not favored improved strategies intended to provide integral care to elderly individuals and their families to minimize the negative impact and complications of falls.

AVALIAÇÃO DA MOBILIDADE E FATORES DESENCADEANTES DE QUEDAS EM IDOSOS

RESUMO

Objetivo: Avaliar a mobilidade funcional, e os fatores de riscos que desencadeiam quedas em idosos atendidos em uma Unidade Básica de Saúde. **Método:** Estudo descritivo, estudo de campo com abordagem quantitativa, realizado em uma Unidade Básica de Saúde com uma amostra de 197 idosos. Foi utilizado um formulário sobre os aspectos sociais de saúde do idoso, fatores de risco intrínsecos, extrínsecos e comportamentais que desencadeiam as quedas e o teste de mobilidade funcional. Utilizaram-se métodos estatísticos descritivos e inferenciais como teste de D'Agostino-Pearson, Qui-Quadrado(10), teste t de Student e Análise de Variância (ANOVA). **Resultados:** A maioria dos idosos tinham escolaridade fundamental incompleto (65.5%), casados (45.7%), que residem com filho (54.8%), lazer e televisão (47.2%) e auto percepção da saúde regular (46.7%) e sexo feminino (70.1%). Entre os fatores relacionados a maior probabilidade de risco de queda estão: presença de fratura, luxação e dificuldade para andar, iluminação ruim na residência, utilização de 5 ou mais medicamentos. **Conclusão:** Percebe-se nos resultados que os idosos têm risco de queda, mas, ainda apresentam uma mobilidade funcional adequada nos idosos mais jovens.

Palavras-chave: Idoso. Equilíbrio Postural. Atenção Primária a Saúde.

EVALUACIÓN DE LA MOVILIDAD Y LOS FACTORES DESENCADENANTES DE CAÍDAS EN ANCIANOS

RESUMEN

Objetivo: evaluar la movilidad funcional, y los factores de riesgos que desencadenan caídas en ancianos atendidos en una Unidad Básica de Salud. **Método:** estudio descriptivo, estudio de campo con abordaje cuantitativo, realizado en una Unidad Básica de Salud con una muestra de 197 ancianos. Fue utilizado un formulario sobre los aspectos sociales de salud del anciano, factores de riesgo intrínsecos, extrínsecos y comportamentales que desencadenan las caídas y el test de movilidad funcional. Se utilizaron métodos estadísticos descriptivos e inferenciales como test de D'Agostino-Pearson, Chi cuadrado (10), test t de Student y Análisis de Varianza (ANOVA). **Resultados:** la mayoría de los ancianos

tenía escolaridad primaria incompleta (65.5%), casado (45.7%), que vivían con el hijo (54.8%), ocio y televisión (47.2%) y auto percepción de la salud regular (46.7%) y sexo femenino (70.1%). Entre los factores relacionados a la mayor probabilidad de riesgo de caída están: presencia de fractura, luxación y dificultad para caminar, mala iluminación en la residencia, utilización de 5 o más medicamentos. **Conclusión:** se percibe, en los resultados, que los ancianos tienen riesgo de caída, pero, aún presentan una movilidad funcional adecuada en los ancianos más jóvenes.

Palabras clave: Anciano. Balance Postural. Atención Primaria de Salud.

REFERENCES

1. Silva NTF, Ribeiro RCHM, Galisteu KJ, Cesarino CB, Pinto MH, Beccaria LM. Profile of older adult victims of trauma cared for in the emergency care unit of a teaching. *Cienc Cuid Saude* [on line]. 2018; 17(2): 2-8. Doi: <https://doi.org/10.4025/cienccuidsaude.v17i2.42045>.
2. Queiroz SMB, Coutinho DTR, Almeida PC, Guedes MVC, Freitas MC. Clinical conditions of elderly who are victims of muscle-skeletal trauma. *Cienc Cuid Saude* [on line]. 2016; 15(3):530-537. Doi: <https://doi.org/10.4025/cienccuidsaude.v15i3.28482>.
3. Cunha P, Pinheiro LC. The role of physical exercise in the prevention of falls in the elderly: an evidence based review. *Rev. port. med. geral. fam.* [S.I.]. 2016; 32(2): 96- 100. Doi: <https://doi.org/10.32385/rpmgf.v32i2.11732>.
4. Possamai-Menezes L, Stamm B, Tambara-Leite M, Hildebrandt L, Kirchner R. Falling is a part of life: Falls risk factors to the elderly. *Rev Fund Care Online* [Internet]. 2016; 8(4): 5080-5086. Doi: <http://dx.doi.org/10.9789/2175-5361.2016.v8i4.5080-5086>.
5. Abdala RP, Barbiere Junior W, Bueno Junior CR, Gomes MM. Gait Pattern, Prevalence of falls and fear of falling in active and sedentary Elder women. *Rev Bras Med Esporte* [Internet]. 2017; 23(21): 26-30. Doi: <http://dx.doi.org/10.1590/1517-869220172301155494>.
6. Morsch P, Myskiw M, Myskiw JC. Falls' problematization and risk factors identification through older adults' narrative. *Ciênc. Saúde Coletiva* [Internet]. 2016; 21(11): 3565- 3574. Doi: <http://dx.doi.org/10.1590/1413-812320152111.06782016>.
7. Bennett J, Vêra I, Sena K, Lemos M, Lucchese R, Silva G. Evaluation and intervention of equilibrium in the elderly. *Rev. Enferm. UFPE on line* [Internet]. 2018; 12(9): 2479-2497. Doi: <https://doi.org/10.5205/1981-8963-v12i9a234724p2479-2499-2018>.
8. Nascimento JS, Tavares DMS. prevalence and factors associated with falls in the elderly. *Texto Contexto – enferm.* 2016; 25(2): 1-9. Doi: <http://dx.doi.org/10.1590/0104-07072016000360015>.
9. Lima FFO, Ferreira JB, Reis LA, Santos KT, Lima LS, Moraes KCS. Sociodemographic profile and level of functional dependence of the elderly at risk of falls. *Id on line.* 2017; 11(39): 164-178. Disponível em: <https://idonline.emnuvens.com.br/id/article/view/985>.
10. Gaspar ACM, Azevedo RCS, Reiners AAO, Mendes PA, Segri NJ. Factors associated with fall prevention practices in older adults. *Rev. Enferm. Esc. Anna Nery.* 2017; 21 (02): 01-08. Doi: <https://doi.org/10.5935/1414-8145.20170044>.
11. Perseguino MG, Horta ALM, Ribeiro CA. The family in face of the elderly's reality of living alone. *Rev Bras Enferm.* 2017; 70(2):235-241. Doi: <https://doi.org/10.1590/0034-7167-2016-0398>.
12. Naman M, Streit IA, Fortunato AR, Marinho A, Mazo GZ. LEISURE AT DIFFERENT STAGES OF LIFE OF CENTENARIANS. *Licere.* 2017; 20 (1): 201- 220. Doi: <https://doi.org/10.35699/1981-3171.2017.1593>.
13. Dresch FK, Barcelos ARG, Cunha GL, Santos GA. Auto perceived health condition and prevalence of chronic diseases nontransmissible in elderly family health strategy. *Rev. Conhec. online.* 2017; 2(9): 118-127. Doi: <https://doi.org/10.25112/rco.v2i0.1183>.
14. Chehuen Neto JA, Brum IV, Braga NAC, Gomes GF, Tavares PL, Silva RTC, et al. Fall awareness as a determining factor of this event among elderly community residents. *Geriatr Gerontol Aging.* 2017; 11(1):25-31. Disponível em: <http://ggaging.com/details/413/pt-BR>.
15. Paula Júnior NF, Santo SMA. Epidemiology of accidental falls among the elderly: survey of the period 2003-2012. *Rev. Min. Enfer.* 2015; 19(4): 994-1004. Doi: <http://www.dx.doi.org/10.5935/1415-2762.20150075>.
16. Guerra HS, Bernardes DCF, Santana JA, Barreira LM, Sousa RA, Neves CM. Evaluation of the risk of falls in elderly people in the community. *Rev. Saúde.Com.* 2017; 13(2): 879-886. Doi: <http://dx.doi.org/10.22481/rsc.v13i2.434>.
17. Reis LA, Rocha TS, Duarte SFP. Falls: risk and associated factors in institutionalized elderly. *Rev. Baiana enferm.* 2014; 28(3): 225-234. Doi: <http://dx.doi.org/10.18471/rbe.v28i3.12303>.
18. Luzardo AR, Paula Júnior NF, Medeiros M, Lima LSB, Wolkers PCB, Santos SMA. Fall of elderly: revealing vulnerability situations. *REME – Rev Min Enferm.* 2017; 21:e-1025. Doi: <http://www.dx.doi.org/10.5935/1415-2762.20170035>.
19. Carvalho CJA, Bocchi SCM. The elderly recognizing themselves as vulnerable to falls in the concreteness of the femoral fracture. *Rev. Bras. Enferm.* 2017; 70(2): 279- 286. Doi: <https://doi.org/10.1590/0034-7167-2016-0392>.
20. Rosa BM, Abreu DPG, Santos SSC, Silva BT, Ilha S, Martins NFF. Association between fall risks and medication use in the elderly. *Rev baiana enferm.* 2017;31(4):e22410. Doi: <http://dx.doi.org/10.18471/rbe.v31i4.22410>.

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