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RISK FACTORS ASSOCIATED WITH FALLS IN ELDERLY

FATORES DE RISCO ASSOCIADOS A QUEDAS EM IDOSOS

FACTORES DE RIESGO ASOCIADOS A LAS CAÍDAS EN LOS ANCIANOS

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ABSTRACT

Objective: to determine the prevalence and the risk factors associated with falls in elderly in the extent of the Family Health Strategy in a capital of the Brazilian Northeast. **Method:** a cross-sectional study conducted with 174 elderly. The data collection occurred through semi-structured interviews during the home visits. The data were consolidated with the Excel 2007 program tables and processing and statistical analyses were performed through SSPS®, version 20.0 for Windows. **Results:** the average age was 70.6 ± 8.4 years old; with prevalence of falls in 51.1% of the sample. The main place of the falls was at home (57.3%). The main factors that lead to falls were inattention, vision problems, presence of obstacles and imbalances. There were described risk factors in 3.5 more times for dependents when compared to independents. **Conclusion:** the prevalence of falls was high, with need for care and functional dependence associated to the occurrence. The nurses can work for the development of preventive actions. **Descriptors:** Elderly; Accidents by Falls; Public Health; Nursing.

RESUMO

Objetivo: conhecer a prevalência e fatores de risco associados às quedas entre idosos em área da Estratégia Saúde da Família em uma capital do Nordeste brasileiro. **Método:** estudo transversal realizada com 174 idosos. A coleta dos dados ocorreu por meio de entrevista semiestruturada realizada durante visita domiciliar. Os dados foram consolidados em tabelas do programa Excel 2007 e o processamento e a análise estatística foram realizados por meio do SSPS®, versão 20.0 para Windows. **Resultados:** a média de idade foi $70,6 \pm 8,4$ anos; com prevalência de quedas em 51,1% da amostra. O principal local de queda foi no domicílio (57,3%). Principais fatores que levaram às quedas foram desatenção, problemas de visão, presença de obstáculos e desequilíbrios. Evidenciaram-se chances de queda descrita em 3,5 mais vezes para os dependentes quando comparados com os independentes. **Conclusão:** a prevalência de quedas apresentou-se alta, com necessidade de cuidado e dependência funcional se associando à ocorrência, podendo o enfermeiro atuar no desenvolvimento de ações preventivas. **Descritores:** Idoso; Acidentes por Quedas; Saúde Pública; Enfermagem.

RESUMEN

Objetivo: determinar la prevalencia y los factores de riesgo asociados a las caídas en los ancianos en el área de la Estrategia de Salud de la Familia en una capital del Noreste de Brasil. **Método:** este es un estudio transversal conducido con 174 personas de edad avanzada. Los datos fueron recolectados a través de entrevistas semiestructuradas realizadas durante las visitas a domicilio. Los datos fueron consolidados con el Excel 2007 y el procesamiento y el análisis estadísticos fueron conducidos a través del SSPS®, versión 20.0 para Windows. **Resultados:** la edad media fue de $70,6 \pm 8,4$ años, con una prevalencia de caídas en el 51,1% de la muestra. El sitio principal fue en el hogar (57,3%). Los factores principales que llevaron a caídas fueron la falta de atención, los problemas de visión, la presencia de obstáculos y desequilibrios. Se presentaron abajo posibilidades descritas en 3,5 veces más a personas dependientes en comparación con los independientes. **Conclusión:** la prevalencia de las caídas presentóse alta, en necesidad de atención y dependencia funcional asociando se a la ocurrencia, lo que accede al enfermero actuar para el desarrollo de acciones preventivas. **Descriptores:** Anciano; Accidentes por Caídas; Salud Pública; Enfermería.

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INTRODUCTION

Increased longevity and the quick process of population aging combined with the public health system problems are the area of interest and concern of the health professionals and of society in general because of the social and economic repercussions.

The increase of the elderly population proportionally occurs quickly and with emphasis in developing countries. Parallel with the change of the age structure, there is the concern with the quality of life and well-being of older people, in view of the changes in the population's morbidity and mortality profile.¹

In Brazil, the statistical projections estimate exponential growth of the population, especially the group of elderly people,² thus having the need for adequate knowledge about the problems that reaches it.³

Falls among elderly represent a serious public health problem which has impact and dimension unnoticed by the Brazilian society and, with rare exceptions, has not been adequately discussed in academic circles, but also in the context of health policies. The falls did not receive the deserved attention among the health professionals, who consider only inevitable consequences of aging. These are actually causing multifactorial pathological events of injuries, emotional disorders, functional decline and death which causes can be prevented and diagnosed, and consequently, generate reduce of morbidity, mortality, and financial costs.^{1,4,5}

To prevent falls it is necessary the recognition and the alteration of risk factors involved in their occurrence. The risk factors are classified into intrinsic and extrinsic, those are inherent to the individual (physiological changes related to aging, such as age, presence of multiple diseases, continuous medication, decreased cognition, reduce of the functional capacity, foot problems, auditive and proprioceptive deficits, impaired balance, among others); the latter are related to environmental conditions (exposure to sliding floors, poorly illumination of the environments, the lack of handrails, etc).⁵⁻⁷

When considering the expansion of the Family Health Strategy (FHS) in Brazil as a priority mechanism for the reorganization of primary care, it is clear that it is important for nurses and the whole multidisciplinary team are aware about the prevalence of this event and risk factors associated to start

and/or intensification of the establishment of strategies for preventing falls in the home and comprehensive care to the elderly. Thus, this study aimed to determine the prevalence and risk factors associated with falls among elderly people living in the area enrolled in the Family Health Strategy in a Brazilian Northeast capital.

METHOD

This is a cross-sectional study with a quantitative approach, conducted in an area of activity of the FHS in the city of Teresina/PI, Brazil. The sample was probabilistic, stratified and random calculated in the population proportion of elderly individuals registered in Form A (318) of the selected FHS, in six micro areas. After applying the Cochran Scale for finite populations, the minimum sample size obtained was of 174 elderly, according to the sum of the minimum sample of the micro areas; considering a sampling error of 5%.

There were excluded from the study the elderly that presented aggravation or neurological sequelae that prevented understanding of the interview. The participants were informed about the research objectives and there were assured the anonymity and voluntary participation.

The data collection occurred from January to February 2014 through semi-structured interviews conducted during home visits. The instrument discussed information about the socio-demographic data, lifestyle habits, and clinical conditions and of risk for the elderly, the level of dependence to perform activities of daily living (Barthel Index) and the occurrence of falls in the last 12 months, and as circumstances related to this.

In case of more than one fall there was considered the latest tool for filling purposes. As definition of the fall there was adopted the one of the World Health Organization, characterized as the situation of being in a lower or a higher level, excluding changes that bring support on furnitures, walls or other objects, causing or not injuries and/or damages.⁸

The data were consolidated into Excel 2007 program tables and the processing and statistical analysis were performed using the program SSPSS® (Statistical Package for Social Sciences), version 20.0 for Windows. Quantitative variables were presented by descriptive statistics: average, standard deviation; and qualitative analysis of frequency. The association between the variables was performed using the Chi-square test (χ^2). Based on the analysis of binary

logistic regression, with the dependent variable occurrence of falls in the last 12 months, being used the method of the Backward for Wolde. A priori there was held the association of occurrence of falls with sociodemographic conditions and subsequently to the clinical conditions and of risk. The risk of falls was calculated using the odds ratio (Odds Ratio-OR) with its IC 95%. In all the applied tests there was considered a statistical significance level of 95%, ie, $p < 0.05$.

For a best viewing of the results of the classification of Barthel dependence, the moderate and severe dependence classification composed the dependent variable.

In accordance with the Resolution 466 from 12nd December 2012⁹ there was forwarded the research to the Ethics Committee of the institution where it was developed and evaluated as favorable CAAE N^o 20215013.1.0000.5214. It was obtained from the research participants the Consent Term.

RESULTS

Table 1 shows the data of the socio-demographic characteristics of the study population. Of the 174 interviewed elderly,

60.3% were male. The age of both genders ranged from 60 to 96 years old, with an average of 70.6 ± 8.4 years. Most (54.6%) were in the age group between 60 and 69 years old. There was the proportion of 37.9% of elderly people who had no schooling. Only 1.2% had higher education or vocational course. There was a predominance of elderly who lived with spouse (89.7%) and had a partner (61.0%). The number of retired elderly was of 66.7% and 88.5% reported family income of up to two minimum wages.

The occurrence of falls reported by older people in the last 12 months was of 51.1% (IC of 95%; 43.6 to 58.7). For females, the prevalence was of 36.0% and males 64.0%. The absolute frequency of falls ranged from one to three in the last 12 months.

According to the Chi-square test (χ^2) there was no association of the occurrence of falls with socio-demographic variables, as well as there was not verified odds ratio of occurrences of falls with the above variables (Table 1).

Table 1. Characterization and socio-demographic association of the population under study, according to the distribution of the occurrence of fall (n=174).							
Variables	Falls in the latest 12 months				P*	OR** (IC 95%)	P
	No		Yes				
	n	%	n	%			
Gender							
Female	37	43,5	32	36,0	0,307	1	0,419
Male	48	56,5	57	64,0		1,304 (0,685-2,483)	
Age (years)							
60-69	46	54,1	49	55,1	0,828	1	0,239
70-79	25	29,4	23	25,8		0,630 (0,292-1,358)	
≥80	14	16,5	17	19,1		0,562 (0,215-1,468)	
Schooling							
With schooling	58	68,2	50	56,2	0,069	1	0,079
No schooling	27	31,8	39	43,8		1,740 (0,937-3,251)	
Marital status							
With spouse	53	62,4	43	49,4	0,088	1	0,194
Without spouse	32	37,6	44	50,6		1,519 (0,808-2,857)	
Family arrangement							
Not alone	78	91,8	78	87,6	0,372	1	0,391
Alone	7	8,2	11	12,4		1,642 (0,529-5,095)	
Retired							
No	33	38,8	25	28,1	0,090	1	0,136
Yes	52	61,2	64	71,9		1,636 (0,857-3,124)	
Family income (minimum wages)							
>2	12	14,1	8	9,00	0,289	1	

≥ 2	73	85,9	81	91,00		1,754 (0,664-4,635)	0,257
SM: Minimum Wage (R\$=678,00); OR - Odds Ratio; D.P - Standard Deviation. *Chi-square test of Pearson (χ^2) **Binary logistical regression							
Table 2 shows data about lifestyle habits, medical conditions and risk factors of falls associated with the prevalence of falls in the last 12 months. There was a significant association of the variables of need for care				and Barthel classification for dependent subjects, which showed that people in need of care and those having dependence for activities of daily living had a risk of falling about 80%; 3.5 times more likely.			
Tabela 2. Dados relativos aos hábitos de vida, condições clínicas e de risco dos participantes da pesquisa e associação da prevalência com os mesmos (n=174).							
Variables	Falls in the latest 12 months				P*	OR** (IC95%)	P
	No		Yes				
	n	%	n	%			
Alcoholic							
No	40	47,1	53	59,6	0,193	1	0,124
Yes	14	16,5	9	10,1		0,461 (0,172-1,237)	
Former alcoholic	31	36,5	27	30,3		0,644 (0,316-1,300)	0,218
Smoker							
No	30	35,3	38	42,7	0,197	1	0,214
Yes	11	12,9	17	19,1		1,896 (0,691-5,202)	
Former alcoholic	44	51,8	34	38,2		0,756 (0,368-1,561)	0,445
Practice of physical activity							
Yes	20	23,5	19	21,3	0,728	1	0,668
No	65	76,5	70	78,7		1,186 (0,545-2,580)	
Stays only most of the day							
Yes	19	22,4	21	23,6	0,846	1	0,682
No	66	77,6	68	76,4		0,851 (0,393-1,842)	
Need for care							
No	67	78,8	78	87,6	0,119	1	0,007
Yes	18	21,2	11	12,4		0,250 (0,092-0,682)	
Comorbidities							
No	13	15,5	11	12,4	0,553	1	0,206
Yes	71	84,5	78	87,6		1,673 (0,753-3,717)	
Use of medication							
No	20	23,8	19	21,3	0,699	1	0,791
Yes	64	76,2	70	78,7		0,848 (0,251-2,870)	
Vision problems							
No	22	25,9	16	18,0	0,207	1	0,168
Yes	63	74,1	73	82,0		1,707 (0,799-3,648)	
Auditive problems							
No	61	71,8	58	65,2	0,350	1	0,591
Yes	24	28,2	31	34,8		1,219 (0,591-2,514)	

Walking problems							
No	73	85,9	71	79,8	0,286	1	
Yes	12	14,1	18	20,2		2,255	0,173
						(0,700-7,268)	
Barthel Classification							
Independent	47	55,3	40	44,9	0,195	1	
Nearly independent	18	21,2	17	19,1		1,358	0,460
						(0,603-3,056)	
Dependent	20	23,5	32	36,0		3,501	0,005
						(1,461-8,388)	

*Chi-square test of Pearson (χ^2)

**Binary logistical regression

According to the data in Table 3, the elderly presented as main reasons for occurrence of falls: inattention, followed by diseases that hinder walking. Among the favorable environmental conditions there

were highlighted the irregularities on surfaces and slippery floors. Falls occurred predominantly during the day. The main place of the falls was the household.

Table 3. Population distribution of the study according to the conditions of the falls. Teresina-PI, Brazil, 2014 (n=89).

Variables	n	%
Number of falls		
1	57	64,0
2 or more	32	36,0
Place of the fall		
Household	51	57,3
Away from home	38	42,7
Shift		
Daytime	64	71,9
Nocturne	25	28,1
Reason of the fall		
Lack of attention	27	30,3
Vision problems	04	4,5
Imbalance for no apparent reason	09	10,1
Dizziness, vertigo or fainting	04	4,5
Diseases that make difficult walking	13	14,6
Other	32	36,0
Environmental conditions		
Irregularity of the surfaces	41	46,1
Slippery floors	17	19,1
Obstacles on the floor	05	5,6
Few lightening	09	10,1
Absence of supports on the wall	01	1,1
Other	16	18,0
Complications after the falls		
Yes	47	53,4
No	41	46,6
Type of complications		
Fracture or dislocation	40	85,1
Other	7	14,9

DISCUSSION

It was observed influence of increased longevity when registering high quantity of elderly in the study area, the reality experienced in the society in which projections indicate that between 2020 and 2050 the number of people over 60 years old will be 28.3 million to 64 million.^{2,10}

There was a predominance of men, contrary to current Brazilian demographic standard, which mentions the female population as most quantitative among elderly people over 60 years old, and longer life expectancy.¹⁰

The study showed higher prevalence rates of illiteracy than the national average, which corresponds to 26.6% for the population over 60 years old. However, the average of the

studied population was less than the average of the Northeast Region, which corresponds to 47.2%. In Brazilian regions the literacy level is substantially lower in the lower income strata¹⁰, a reality that matches with the studied population.

When approaching some clinical conditions of the elderly health, and according to what was found in this study, it is stated that aging brings with it the increase of chronic and non-communicable diseases, the main hypertension and osteoarticular diseases.¹⁰

Added to the increase of prevalence, the aging process brings the progression of biological deficits; there is no loss of functional capacity. Consequently, there is minimizing of the functional independence to perform basic and instrumental activities of daily living and a greater need for care. The loss of function implies dependence for personal care, mobility, locomotion and eliminations.^{4,5,7,11-2} In contrast to the progression of loss of functional abilities, there is an increased risk for falls.⁷ In the results, it was realized important part of people who had some level of dependence according to Barthel classification, which can be associated with the prevalence of the found falls.

The prevalence of falls found in the study population was higher than that found in other cross-sectional studies.^{1,2,13-15} The greater incidence of falls prevailed among elderly males compared to females. Dissonant information to the literature showing episode falls as the predominant event female, due to the presence of minor amount of lean mass and muscle mass, the greater number of morbidities, and hence a worse functional state, and most exposure to extrinsic factors such as performing household activities.^{11,13,16-8}

The greater the chronological age, the greater the chances of falls, because aging causes loss of body balance and changes in muscle and bone mass.¹⁹ However, this situation was not confirmed in this study showed that elderly people with lower age were those who suffered more falls.

In the present study there was not significance for the increase in living alone falls. Who is with whom they live, have healthier living habits, do not feel disadvantaged, and collaborate to prevent the event of falls, and the fact of living alone is a risk factor for falls.²⁰ The situation of living alone in Brazil is 14% among people over 60 years old, and there is a situation found in the studies and be considered a risk factor for fall occurrence in this population.^{10,16}

In the context of lifestyle, there are several modifiable factors that may interfere in the binomial health / disease, including smoking, alcohol consumption and physical activity. In the study there was identified relevant quantitative elderly who did not have healthy lifestyle habits, such as smoking, drinking alcohol, and especially not practice of physical activity. There are notes that emerge from the use of alcohol in the elderly as influential factor in the event of falls,¹⁸ but this study did not show alcohol consumption with significant risk factor.

Elderly people who practice some form of physical activity have fewer falls, compared to those considered sedentary because inactivity can result in decrease or loss of functional capacity in the elderly, thereby raising the risk of falls.¹⁶ In addition, physical activity promotes functional autonomy, increased strength and physical fitness with improved balance and provides healthier aging.^{11,14,21} Moreover, physical activity provides reduction of the changes resulting from the aging process, considerably reducing falls and consequently improving the quality of life for this population.¹³⁻¹⁶

According to the survey, older people who have two or more comorbidities have a higher percentage of falls than those who have only one. This result is in agreement with previous studies, which found that elderly people with more diseases fall more.¹⁵

The study showed a significant association of the prevalence of falls on the condition requires care and present dependence according to Barthel rating, which was also evidenced in another study.¹²

Elderly who use continuous medications are the ones that fall, especially those that cause drowsiness and changes in balance, muscle and hypotension stress, as is the case of antihypertensive medications in addition to those that may cause nausea, dizziness and postural hypotension.¹⁶ In the present study this information may be considered as a risk factor for the occurrence of falls, since most made continuous use of medication, especially antihypertensive drugs.

The decrease in eyesight and hearing, too, was quite influential risk factor in the event of falls among elderly respondents. Elderly people who have visual problems tend to develop postural control deficiency, functional impairment and, therefore, increase the event risk of falls.^{20,22-3} The reduction or loss of hearing acuity is an influential and quite significant risk factor for falls among the elderly.²⁰

Epidemiology concerning the evaluation of the place of occurrence of falls indicates the home or around the home as the primary place of occurrence of falls.²⁴⁻⁶ This prerogative was also observed in this study.

Regarding the shift of occurrence there was a higher number of falls during the day, which is consistent with a study that showed similar results, inferring that this is due to the fact the day correspond to the period in which the elderly are presented more active and develop more activities in relation to night shift.⁷

The event of falls in the elderly can generate from simple complications such as abrasions to more complex consequences, such as fear of falling syndrome, weakening health and limitations to perform activities of daily living.²⁰ The study also showed that more than half of the population, suffered one or more episodes of fall in the last twelve months. This percentage, more than half have resulted in some kind of complication, and fracture of any bone in the body (hip, femur, arm, forearm, leg and foot) and dislocation were the main, and a small amount had other consequences (bruises, abrasions etc.), reassuring the literature.¹¹

CONCLUSION

There was found high prevalence of falls in the studied elderly, and when associating the sociodemographic profile, the clinical conditions and living habits to falls, it was found that 80% of elderly people who needed care showed more falls. Dependence showed decrease of odds ratio of 3.5 times more, compared to independent.

Thus, there is a clear statement that the increased longevity of the population requires public policy formulations applicable to this group, especially in primary care, since aging requires demand for services, care and benefits that are peculiar and as well represents challenges for governments and society in general.

This study has limitations and difficulties due to the small sample size; however, it has put forward information about the risk factors presented by the population, which will assist in the development of preventive care plans.

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