Risk of falls and associated factors in institutionalized elderly

Risco para quedas e fatores associados em idosos institucionalizados

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Objective: to identify the factors associated with the risk of falls in institutionalized elderly. **Methods:** analytical study carried out in two long-stay institutions for the elderly, with 61 residents of both sexes. Data collection was performed by means of a socio-demographic and clinical form and Downton's Fall Risk Index. **Results:** 31 (50.8%) old people at high risk of falling were identified. There was an association of risk for falls in institutionalized elderly with gender (p=0.007), age (p=0.004), time of institutionalization (p=0.028), adverse events (p=0.000), use (p=0.035) and number of drugs (p=0.038), use of auxiliary equipment (p=0.022), type of walking (p=0.044) and history of falls in the last 12 months (p=0.000) **Conclusion:** it is recognized as essential to identify factors associated with the occurrence of falls for the prioritization of specific interventions aimed at institutionalized elderly.
Descriptors: Health of the Elderly; Accidental Falls; Homes for the Aged; Nursing.

Objetivo: identificar os fatores associados ao risco para quedas em idosos institucionalizados. **Métodos**: estudo analítico realizado em duas Instituições de Longa Permanência para idosos, com 61 residentes de ambos os sexos. A coleta de dados foi realizada por meio de formulário sociodemográfico e clínico e Escala de risco para quedas de Downton. **Resultados:** identificaram-se 31 (50,8%) idosos com alto risco para queda. Houve associação de risco para quedas em idosos institucionalizados com sexo (p=0,007), idade (p=0,004), tempo de institucionalização (p=0,028), eventos adversos (p=0,000), uso (p=0,035) e quantidade de medicamentos (p=0,038), uso de equipamentos auxiliares (p=0,022), tipo de marcha (p=0,044) e histórico de quedas nos últimos 12 meses (p=0,000). **Conclusão:** reconhece-se como imprescindível a identificação de fatores associados à ocorrência de quedas para a priorização de intervenções específicas voltadas a idosos institucionalizadas.
Descritores: Saúde do Idoso; Acidentes por Quedas; Instituição de Longa Permanência para Idosos; Enfermagem.

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Introduction

The fastest growing population segment in Brazil is the elderly, with estimated increase of over 4.0% per year in the period from 2012 to 2020. This fact creates a significant impact on the Brazilian population projection which points that in 2060 there will be about 73.5 million people of this age group in the country[1].

Changes in the population's age profile associated with epidemiological changes have resulted in numerous challenges to health professionals, especially for the management of diseases related to aging. In this regard, there is the occurrence of falls as predictor of numerous negative outcomes to the health of the elderly, such as functional and cognitive decline, and as the leading cause of unintentional injuries and premature deaths worldwide[2-3].

More than a third of individuals aged 60 or more fall every year, with unfavorable trends among older adults living in long-stay institutions, of which about 30 to 50.0% fall every year[4-5]. Institutionalization may be related to various risks for falls with higher prevalence of comorbidities, strong functional and cognitive decline, use of multiple medications, among others[4-7].

Institutionalized elderly often have more than one risk factor for falls[4], which favors recurring events and with more serious consequences. In this sense, the risk assessment for falls in the elderly by health professionals should consider the context in which individuals are and the factors related to these events. The identification of these factors favors the development of care plans aimed at minimizing these events as well as reduce the possible complications from falls.

Therefore, this study aimed to identify factors associated with the risk for falls in institutionalized elderly.

Methods

This is an analytical study conducted in the period from February to April 2015, in two long-stay institutions for the elderly located in the region of Campos Gerais, Paraná State, Brasil, and that had a total of 64 residents.

The study population was composed of all the residents of the institutions who were 60 years old or older, from both sexes. The study exclusion criteria were residents who were not present at the time of data collection or who lived in the institution for less than three months. The final sample consisted of 61 elderly.

Data collection was conducted from residents' medical records, with analysis of the information contained in the twelve months prior to the collection period, through the filling of a structured form which contained the following variables: age, sex, contact with family, use of auxiliary equipment, type of walking, time of institutionalization, adverse events, medication use, amount of drugs, types of drugs used, falls in the last 12 months and consequences of falls.

One applied the Downton's Fall Risk Index, which evaluates the following elements: occurrence of previous falls, medication administration, sensory deficit, level of current mental state and ambulation pattern, with a total score from zero to eleven. Scores equal or higher than three points indicated high risk for falls, while values below this score indicated low risk for falls.

The data collected were tabulated and analyzed using the software Stata version 12. Initially, for descriptive analysis, the minimum, maximum and average values were calculated as well as the distribution of absolute and percentage frequency. Later, for comparison of the variables a univariate analysis using Pearson's chi-square test was performed. Finally, there was the analysis of variance

for the regression model using as basis the F Snedecor test, but one presented only the results for the *t* tests for the coefficients of each simple linear regression model.

The study respected the formal requirements contained in national and international standards of regulatory research involving human subjects.

Results

Of the total of subjects investigated, 31 (50.8%) had high risk for falls. As for this group, there was a predominance of females (21; 67.7%) who had contact with their families (16; 51.6%) did not use auxiliary equipment (21; 67.7%) and who had normal or safe walking with assistance (18; 58.0%) (Table 1).

Most seniors at high risk for falls used polypharmacy, that is, five or more drugs (21; 67.7%), with the predominance of other drugs (28; 90.3%) not included in the classes described in Table 1. Still about this group, the majority had falls in the last 12 months (20; 64.5%), with higher records of pains and bruises as consequences of these events (16; 51.6%) (Table 1).

The group with low risk for falls totaled 30 (49.1%) elderly and differed from that at high risk for presenting predominance of men (20 ; 66.6%), without contact with their families (19; 63.3%), lack of auxiliary equipment (28; 93.3%), use of one to four drugs (16; 53.3%) and non-occurrence of falls in the last twelve months (29; 96.6%) (Table 1).

The minimum and maximum age, respectively, of the residents was 61 and 91 years old (average = 73.45 years), with time of institutionalization of the elderly from 3 to 372 months (average = 89.67 months). Concerning the adverse events, 0 to 13 events per old person in the last twelve months were recorded, with predominance of wounds and bruises on residents who had, respectively, high (9, 29.0%) and low (5; 16.7%) risk for falls. The sample investigated presented simultaneous consumption from 0 to 10 drugs, with an average of 4.85 drugs per elderly (Table 2).

Table 1 - Absolute and percentage distribution of institutionalized elderly regarding socio-demographic and clinical variables

| Variable | Risk for falls | | | p** |
	High n (%)	Low n (%)	Total n (%)	
Gender				
Female	21 (67.7)	10 (33.3)	31 (50.8)	0.007
Male	10 (32.3)	20 (66.7)	30 (49.2)	
Contact with the Family				
Yes	16 (51.6)	11 (36.7)	27 (44.5)	0.240
No	15 (48.4)	19 (63.3)	34 (55.7)	
Auxiliary equipment				
Yes	10 (32.3)	2 (6.7)	12 (19.7)	0.022
No	21 (67.7)	28 (93.3)	49 (80.3)	
Type of walking				
Normal or firm with help	18 (58.0)	15 (50.0)	33 (54.1)	0.044
Not firm with or without help	10 (32.3)	10 (33.3)	20 (32.8)	
Impossible	3 (9.7)	5 (16.7)	8 (13.1)	
Adverse events*±				
Wounds and bruises	9 (29.0)	5 (16.7)	14 (22.9)	<0.001
Sudden illness	4 (12.9)	4 (13.3)	8 (13.1)	
Infection or surgical procedure	1 (3.2)	4 (13.3)	5 (8.2)	
Use of medications				
Does not use	-	2 (6.7)	2 (3.7)	0.035
1 – 4	9 (29.0)	16 (53.3)	25 (41.0)	
5 >	21 (67.7)	13 (43.3)	34 (55.7)	
Medications used*				
Tranquilizers, sedatives	16 (51.6)	10 (33.3)	26 (42.6)	0.134
Hypotensive (non-diuretic)	16 (51.6)	12 (40.0)	28 (45.9)	
Antiparkinson and antidepressants	9 (29.0)	4 (13.3)	13 (21.3)	
Others	28 (90.3)	28 (93.3)	56 (91.8)	
Falls in the last 12 months				
Yes	20 (64.5)	1 (3.3)	21 (34.4)	<0.001
No	11 (35.5)	29 (96.7)	40 (65.6)	
Total	31 (100.0)	30 (100.0)	61 (100.0)	

*Variables that do not reach or exceed the value of falls occurred; **Pearson's chi-square test, with p<0.05; ±One considered all kinds of adverse events with the exception of falls

Table 2 - Coefficients of determination and of simple linear regression and confidence intervals regarding risk for falls and variables in institutionalized elderly

Variables	Determination coefficients	Regression coefficient (ß)	CI 95%	p*
Age (years)	0.13	0.087	0.02 to 0.14	0.004
Institutionalization time (months)	0.04	0.004	0.00 to 0.01	0,028
Number of adverse events	0.46	0.491	0.35 to 0.63	<0.001
Number of drugs	0.07	0.234	0.01 to 0.45	0.038

*t test for the regression coefficient

A significant association between the risk of falls and the age of residents was observed (p=0.004), institutionalization time (p=0.028), the occurrence of adverse events (p=0.000) and the amount of drugs used by the institutionalized elderly (p=0.038). Thus, institutionalized elderly with advanced age, with high consumption of drugs and with more adverse events showed higher risk for falls (Table 3).

Discussion

The limitations of this study were related to the design of the cross-sectional study that prevents greater understanding of cause and effect relations between the variables. Moreover, the development of the study in only two locations made it impossible to check a larger sample.

The associations identified in this study among the risk for falls and several variables in the sample corroborate the multifactorial aspect related to falls. Living in long-stay institutions predisposes the elderly to an increased risk of falls due to the presence of important predictors related to residents, such as comorbidities, sensory and balance deficits, cognitive and functional decline and use of polypharmacy[4,8]. In this sense, the time of institutionalization was associated with the risk for falls, possibly due to the accumulation of risk factors to these events over time.

There was a predominance of female institutionalized elderly with high risk for falls, which may be related to the reduction of muscle mass, more significant in women than in men[9]. The prevalence of sarcopenia in elderly who fall is considered high, with rates of 13.4% and 14.9%, respectively, in men and women aged 65 or more[9].

International research developed with 14,881 Canadians aged 65 or more pointed out that the risk for falls in older women was higher compared to men or even younger elderly[10]. With aging, there is the acceleration of the sarcopenia process and other organic changes, such as reduced visual and auditory acuity, collaborating with an increased risk for these

events. Thus, age is presented as one of the major risk factors for falls[4,6,11].

The use of auxiliary equipment was significantly associated with risk for falls in this study, a fact also pointed out in other international studies[11-12]. Individuals who need help have to walk a more conservative walking pattern, with lower cadence and speed[12]. Furthermore, the care provided in these institutions may not provide the guidance and support for a proper use of the equipment, causing health risks to residents.

In this context, we also identified a significant association between the type of walking and risk for falls. Despite the predominance of elderly in this study with normal or safe walking with help, nearly half of the total sample had unsafe walking (with or without help) or impossible walking. Most falls are favored by balance disorders in the elderly, during some form of walking and especially in unfamiliar environments[13-14]. Seniors who fall tend to have worse walking parameters compared to those who did not have previous falls[14].

In this study, the majority of seniors who had high risk for falls made use of polypharmacy, while those with low risk were using from one to four drugs. There is a strong association between the use of drugs, especially polypharmacy, and risk for falls[4,8,15]. The high number of drugs in institutionalized elderly increases the chances of use of inappropriate drugs and the occurrence of negative outcomes to the health of residents, such as falls[4,16].

Previous falls are considered as one of the most associated factors with new events[6-7,11,17]. In this study, the majority did not mention falls in the last twelve months, however, among those at high risk, there was historical predominance of falls in the previous year.

The permanence of risk factors, even after the occurrence of falls and the fear of falling again, may explain recurrent events[6,18]. An effective identification of predictors can minimize or even prevent further falls, which can be made possible through a precise

and detailed description of these events by caregivers in long-stay institutions.

Conclusion

In this study, there was an association of risk for falls in institutionalized elderly with sex, age, time of institutionalization, adverse events, use and amount of medications, use of auxiliary equipment, type of walking and history of falls in the last 12 months.

The health conditions of the elderly people living in that particular care model reinforce the importance of a multidimensional evaluation. The risk assessment for falls in institutionalized elderly favors the reduction of recurrent events and their consequences, through multidisciplinary care in a safe environment, being one of the responsibilities of nurses who work in these services.

Collaborations

Stremel AIF and Silva JHO contributed to the design, data collection, analysis and writing of the article. Sousa JAV, Grden CRB, Borges PKO and Reche PM contributed to the project design, review, data analysis, review and final approval of the version to be published.

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