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Risk of falls in hospitalized elderly people

Risco de quedas em pessoas idosas hospitalizadas

Riesgo de caídas en personas ancianas hospitalizadas

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ABSTRACT

Objective: To assess the risk of falls in hospitalized elderly people.
Method: Cross-sectional study with a quantitative approach, carried out at University Hospital of the State of Paraíba. The sample consisted of 284 elderly subjects interviewed from April to October 2016. The Morse Fall Scale was used to evaluate the risk of falls.
Results: Elderly males (52, 5%) aged between 60 and 69 years old (58,1%) and who were not literate (38,7%), prevailed. It was verified that 45% of the sample presented a high risk of falls. The secondary diagnosis and the use of intravenous therapy were the criteria that obtained a higher percentage of elderly at risk. Diuretics (p≤0,032), urinary incontinence (p≤0,001), visual deficit (p≤0,001) and heart failure (p≤0,001) were significantly associated with the high risk of falls.
Conclusion: The use of specific tools in the prevention of falls allows the improvement in the quality of assistance based on scientific evidence, allowing effective intervention and potentiating patient safety.
Keywords: Patient safety. Aged. Accidental falls. Hospitalization.

RESUMO

Objetivo: Avaliar o risco de quedas de pessoas idosas hospitalizadas.
Método: Estudo transversal e abordagem quantitativa, realizado em Hospital Universitário do Estado da Paraíba. A amostra configurou-se em 284 idosos entrevistados de abril e outubro de 2016. Utilizou-se a Escala de Morse para avaliar o risco de quedas.
Resultados: Prevaleceram idosos do sexo masculino (52,5%), com 60 a 69 anos (58,1%) e não alfabetizados (38,7%). Verificou-se que 45% da amostra apresentou alto risco de quedas. Diagnóstico secundário e uso de terapia intravenosa foram os critérios que obtiveram um maior percentual de idosos em risco. Os diuréticos (p≤0,032), a incontinência urinária (p≤0,001), deficit visual (p≤0,001) e a insuficiência cardíaca (p≤0,001) apresentaram associação significativa com o alto risco de quedas.
Conclusão: Utilizar ferramentas específicas na prevenção de quedas possibilita melhora na qualidade assistencial baseada em evidências científicas, permitindo intervir de forma eficaz e potencializar a segurança do paciente.
Palavras-chave: Segurança do paciente. Idoso. Acidentes por quedas. Hospitalização.

RESUMEN

Objetivo: Evaluar el riesgo de caídas de personas mayores hospitalizadas.
Método: Estudio transversal y abordaje cuantitativo, realizado en un Hospital Universitario del estado de Paraíba. La muestra se configuró en 284 ancianos entrevistados de abril a octubre de 2016. Se utilizó la Morse Fall Scale para evaluar el riesgo de caídas.
Resultados: Prevalecieron ancianos del sexo masculino (52,5%), entre 60 y 69 años de edad (58,1%) y no alfabetizados (38,7%). Se verificó que el 45% de la muestra presentó alto riesgo de caídas. El diagnóstico secundario y el uso de terapia intravenosa fueron los criterios que obtuvieron un mayor porcentaje de ancianos en riesgo. Los diuréticos (p≤0,032), la incontinencia urinaria (p≤0,001), el déficit visual (p≤0,001) y la insuficiencia cardiaca (p≤0,001) presentaron asociación significativa con el alto riesgo de caídas.
Conclusión: El uso de herramientas específicas en la prevención de caídas posibilita la mejora en la calidad asistencial basada en evidencias científicas, permitiendo intervenir de forma eficaz y potenciar la seguridad del paciente.
Palabras clave: Seguridad del paciente. Anciano. Accidentes por caídas. Hospitalización.

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INTRODUCTION

The main organizational goal inherent in quality of care is the patient's safety with maximum prevention of the occurrence of adverse events, defined as injuries or unintentional damages that result in disability or dysfunction of varying magnitude, temporary or permanent, and/or prolongation of the time of stay in the health service[1].

Brazil is one of the countries that make up the World Alliance for Patient Safety and in 2013, the Ministry of Health (MS) prepared and released the Ordinance 529, which established the National Patient Safety Program (PNSP), which defines the relevant concepts in the area and the main strategies for implementing the program. Among the strategies to reduce the security incidents established by the PNSP is the fall prevention protocol aimed at the hospital environment[2].

The fall constitutes the unintentional displacement of the body to a level lower than the initial position provoked by multifactorial circumstances, resulting or not resulting in damage. It is considered a fall when the individual is found on the ground or when, during the displacement, he/she needs support, even if he/she does not reach the ground[3].

In the hospital environment, the falls represent the third most frequent adverse event reported by Notivisa System of the National Health Surveillance Agency (ANVISA). Data from this system indicate that from March 2014 to March 2017, more than 12 thousand falls were reported and mostly due to lack of balance[4]. The falls suffered by patients during the period of hospitalization are relevant intercurrences that demonstrate the lack of safety in the care, in addition to constitute in the health services one of the priority concerns when discussing healthcare quality control systems[5].

In recent years, hospitalizations due to falls have been intensifying, especially in the elderly, aggravating health/illness conditions and reflecting on increased functional disability. It constitutes the first cause of accidents and the third leading cause of death in people aged 60 and over. Still, it causes an increase in public spending, prolonged bed occupancy of inpatient units, becoming a serious public health problem[6].

It is known that the measurement of the risk of falling is one of the indicators of evaluation of the hospital quality, with regard to patient safety, especially for the elderly with 65 or more years[7]. Thus, it is necessary that health institutions use specific tools, duly validated, which allow a correct assessment of the risk of falling so that they can prevent and reduce them in the hospital environment.

In the present study, it was prioritized by the application of the Morse Scale, since it is a worldwide tool that classifies the risk of falling hospitalized in an effective way. In addition, it enables a more qualified and systematized evaluation of the reality of patient falls in Brazilian health institutions, allowing the establishment of strategies targeted to this event during hospitalization[8].

In view of what has been exposed, we have as guiding questions: What is the risk classification of falls in elderly patients assisted in the hospitalization units of a Public Teaching Hospital when using a scale for evaluating risk of falls? What is the relation between the risk factors for falls and the sociodemographic and clinical profile of these patients?

The identification of the risk of falls through risk scales will favor the orientation of patient-centered nursing care so that interventions can be carried out with the purpose of contributing to the theorizing of the prevention and/or reduction of falls in a hospital context. In addition, the use of a specific instrument adds to the process of as it will allow nurses to plan and direct care in order to meet the individual needs of each patient, in accordance with the risk assessment.

Considering the fall as an incident that can bring multiple consequences to the patient, especially to the elderly, the study aimed to evaluate the risk of falls of hospitalized elderly people.

METHODOLOGY

This is a cross-sectional study and a quantitative approach. This article is part of the results of the Master's thesis titled "Assessment of the risk of falls in elderly people using the Morse Scale" linked to the Graduate Program in Nursing of the Federal University of Paraíba[9].

The study was conducted in a university hospital located in the state of Paraíba, between the months of April and October 2017. Elderly patients of both genders, hospitalized in Surgical Units, Medical Clinic A, B and Infectious-Parasitic Diseases (IPD), aged 60 years and over, were included. Excluding those with functional fallability, i.e., quadriplegic patients, comatose, sedated or without motor activity.

The studied population comprised 1,079 elderly. The sample was determined by accessibility or convenience, according to the inclusion and exclusion criteria, based on the number of visits performed at the designated clinical units from January to December 2016.

The sample size was defined using the calculation for finite populations with known proportions, obtaining a margin of error of 5% (Error=0.05), degree of reliability of 95% (α=0.05, which gives $Z_{0.05/2}$=1.96) and considering a proportion of falls in the elderly equal to 50% (p=0.5), totalizing a sample of 284 participants. Subsequently, it was cal-

culated the size required for each hospitalization unit using a proportional stratified sampling technique, resulting in 119 patients in the Surgical Clinic, 66 in the Medical Clinic A, 76 in the Medical Clinic B and 23 in the IPD.

Data collection was supported by a structured script to obtain personal and social information and the health status of hospitalized patients, the Mini Mental State Examination (MMSE) to evaluate cognitive function and the Morse Scale for the evaluation of the risk of falls. This scale was translated and adapted transculturally into the Portuguese language, proving its great feasibility of application in the Brazilian reality. Each criterion evaluated receives a score that varies from zero to 30 points, totalizing a risk score, whose classification is: low risk, from 0 - 24; moderate risk, 25 - 44 and high risk, ≥ 45[10]. The data collection instrument was validated by experts on the subject, concluding that the language and the presentation of the items were pertinent to the objective of the study.

The data was organized in Excel®, version 2010, containing the coding and a dictionary of all variables. Subsequently, they were exported to the *Statistical Package for the Social Science* (SPSS) version 20.0 and analyzed, presenting the absolute and percentage frequencies, prevalence ratio and their respective confidence interval for the study factors that influenced the risk of falls. The Multivariate Correspondence Analysis technique was applied to evaluate the association between factors and the risk classification as well as the risk assessment using the binary classification model Weight of Evidence. (*Weight of Evidence*) granted by WoE to determine which sociodemographic, clinical, disease, and medicines factors increase the risk of falls. The association between the categorization of risk assessed by the Morse Scale was determined by applying the Chi-Square test of linear association. In all statistical tests, a significance level of 5% was adopted, that is, $p \leq 0.05$.

The project was approved by the Research Ethics Committee of the institution, under opinion 2,193,755 and CAAE No. 62128816.0.0000.5183, on December 23, 2016. The elderly who accepted to participate in the study signed the Free and Informed Consent Term, in two copies.

RESULTS

Among the 284 elderly people included in the sample, men (52.5%), aged 60-69 years (58.1%), with a mean age of 68.4 (± 7.4) years and average length of stay in a hospital of 5.5 (± 7.1) days, with a minimum of 1 and a maximum of 60 days. The elderly were predominantly brown-skinned (44.3%), married/stable union (58.1%) and Catholic (72.9%). The majority (61.3%) reported having attended school, but a large number of non-literates (38.7%) stood out. In relation to the monthly income, it was evidenced that the majority receives only a minimum wage (67.6%), coming mainly from retirement (66.6%). According to the performance of the elderly in the MMSE, 52.5% and 30.6% reached the cohort point 18 and 26, respectively.

In Table 1 is described the risk of falling per unit of hospitalization and the general risk of the elderly evaluated through the application of Morse Scale.

It was verified that 45% elderly, a good part of the sample, presented a high risk of falling, followed by 34.9% with moderate and 20.1% with low risk, respectively.

Table 2 shows the distribution of the patients according to the Morse scale criteria, analyzed separately.

In the history of falls, 46.8% of patients reported having fallen in the last year, while 53.2% said no. Regarding the secondary diagnosis, 80.3% were diagnosed with more than one disease. Regarding walking assistance, the majority of 85.9% was grouped in "None/Bedridden/Helped by Health Professional", as well as in the item "Intravenous Therapy", in which 67.3% were in device use. Regarding the march, it was highlighted that 67.2% of the investigated fell within the sub-item "Normal/No walking, Bedridden, Wheelchair". The majority were oriented regarding their capacity/limitation of walking (95.1%).

Table 1 - Distribution of the elderly, according to the classification of the risk of falls by the Morse Scale and hospitalization units. João Pessoa, Paraiba, 2018

RISK	SURGICAL		CUA*		CUB**		IPD***		GENERAL	
	n	%	n	%	n	%	n	%	n	%
Low	35	29.4	9	13.6	8	10.5	5	21.7	57	20.1
Moderate	40	33.6	27	40.9	24	31.6	8	34.8	99	34.9
High	44	37.0	30	45.5	44	57.9	10	43.5	128	45.0
Total	**119**	**41.9**	**66**	**23.2**	**76**	**26.8**	**23**	**8.1**	**284**	**100.0**

Source: Research data, 2018.
*Clinical Unit A **Clinical Unit B ***Infectious-Parasitic Diseases

Table 2 – Distribution of the elderly according to the evaluation criteria of the Morse Scale.João Pessoa, Paraiba, 2018

Morse Scale Items	N	%
History of Falls		
No	151	53.2
Yes	133	46.8
Secondary Diagnosis		
No	56	19.7
Yes	228	80.3
Aid in walking		
None/Bedridden/Helped by Health Professional;	244	85.9
Crutches/Walking stick/Walker	27	9.5
Furniture/Wall	13	5.6
Endovenous therapy/salinized or heparinized endovenous device		
No	93	32.7
Yes	191	67.3
March		
Normal/Not walking, Bedridden, Wheelchair.	191	67.2
Weak	63	22.2
Committed/Wavering	30	10.6
Mental State		
Oriented/able as to its capacity/limitation	270	95.1
Overestimate Capacity/Forget Limitations	14	4.9

Source: Research data, 2018.

The relationship between risk ratings for falls according to the Morse Scale and the socio-demographic profile of the elderly is presented in table 3.

Among the factors listed, gender was considered significant, in which the high risk was greater for women. With regard to age, the highlight was the age group of 70 to 79 years. It was identified that the elderly that attended the school showed higher quantitative with high risk of falls, reaching significance level of p = 0.047. The classification factor of the Mini Mental State Examination (MMSE) also showed a significant association (p = 0.001), in which the elderly with basic education 65 (22.9%) and average 30 (10.6%) had a higher percentage related to the high risk of fall.

Table 4 shows the medications used by the elderly, self-reported diseases and their association with the risk of falls with the Morse Scale.

The only obvious risk of the association was among Diuretic medicine (p-value = 0.032 < 0.05). Urinary incontinence, impaired vision and heart failure were the diseases that presented statistical significance.

Table 3 – Association of socio-demographic variables with the classification of the risk of falls of Morse Scale. João Pessoa, Paraiba, 2018

Variables	Categories	Risk of falls			p
		Low	Moderate	High	
Gender	Female	27 (9.5)	38 (13.4)	70 (24.6)	0.050
	Male	30 (10.5)	61 (21.5)	58 (20.4)	
Age	60 to 69	46 (16.2)	63 (22.2)	56 (19.7)	< 0.001
	70 to 79	9 (3.2)	26 (9.2)	57 (20.1)	
	80 to 89	2 (0.7)	10 (3.5)	15 (5.3)	

Color and Race	Caucasian	21 (7.4)	35 (12.3)	47 (16.5)	0.957
	Black	10 (3.5)	18 (6.3)	27 (9.5)	
	Brown-skinned	26 (9.2)	46 (16.2)	54 (19.0)	
Marital status	Married/Stable union	32 (11.3)	61 (21.5)	72 (25.4)	0.165
	Widow/widower	10 (3.5)	21 (7.4)	34 (12.0)	
	Single	3 (1.1)	6 (2.1)	12 (4.2)	
	Separated/Divorced	12 (4.2)	11 (3.9)	10 (3.5)	
Attended school	Yes	41 (14.4)	64 (22.5)	69 (24.3)	0.047
	No	16 (5.6)	35 (12.3)	59 (20.8)	
MMSE Classification	Illiterate	2 (0.7)	8 (2.8)	27 (9.5)	0.001
	1 to 4 years	25 (8.8)	59 (20.8)	65 (22.9)	
	5 to 8 years	27 (9.5)	30 (10.6)	30 (10.6)	
	9 or more years	3 (1.1)	2 (0.7)	6 (2.1)	
Religion	Catholic	41 (14.4)	73 (25.7)	93 (32.7)	0.997
	Evangelical	14 (4.9)	23 (8.1)	30 (10.6)	
	Others	2 (0.7)	3 (1.1)	5 (1.8)	

Source: Research data, 2018.

Table 4 – Association of the use of medicines and self-reported diseases classified as risk of falls in the Morse Scale. João Pessoa, Paraiba, Brazil, 2018

		Risk of falls n (%)			p
		Low	Moderate	High	
Tranquilizer / Sedative	Yes	5 (1.8)	9 (3.2)	20 (7.0)	0.122
	No	52 (18.3)	90 (31.7)	108 (38.0)	
Diuretic	Yes	12 (4.2)	32 (11.3)	48 (16.9)	0.032
	No	45 (15.8)	67 (23.6)	80 (28.2)	
Antihypertensive	Yes	33 (11.6)	61 (21.5)	83 (29.2)	0.360
	No	24 (8.5)	38 (13.4)	45 (15.8)	
Antiparkinsonian	Yes	0 (0.0)	1 (0.4)	1 (0.4)	0.644
	No	57 (20.1)	98 (34.5)	127 (44.7)	
Antidepressant	Yes	8 (2.8)	8 (2.8)	17 (6.0)	0.857
	No	49 (17.3)	91 (32.0)	111 (39.1)	
Urinary incontinence	Yes	12 (4.2)	24 (8.5)	60 (21.1)	< 0.001
	No	45 (15.8)	75 (26.4)	68 (23.9)	
Hearing loss	Yes	2 (0.7)	6 (2.1)	5 (1.8)	0.926
	No	55 (19.4)	93 (32.7)	123 (43.3)	
Visual deficit	Yes	22 (7.7)	47 (16.5)	88 (31.0)	< 0.001
	No	35 (12.3)	52 (18.3)	40 (14.1)	
Musculoskeletal Problems	Yes	18 (6.3)	27 (9.5)	52 (18.3)	0.113
	No	39 (13.7)	72 (25.4)	76 (26.8)	
Heart failure	Yes	6 (2.1)	21 (7.4)	46 (16.2)	< 0.001
	No	51 (18.0)	78 (27.5)	82 (28.9)	

Labyrinthitis	Yes	14 (4.9)	21 (7.4)	42 (14.8)	0.129
	No	43 (15.1)	78 (27.5)	86 (30.3)	
Hypertension	Yes	32 (11.3)	62 (21.8)	95 (33.5)	0.104
	No	25 (8.8)	37 (13.0)	33 (11.6)	
Diabetes	Yes	15 (5.3)	42 (14.8)	51 (18.0)	0.152
	No	42 (14.8)	57 (20.1)	77 (27.1)	

Source: Research data, 2018.

DISCUSSION

Esse estudo buscou avaliar o risco de quedas de pessoas idosas hospitalizados pela Escala de Morse e sua relação com fatores sociodemográficos e clínicos identificados.

On the significant results between the association of age and gender with the risk of falls, it is known that age above 60 years is considered as an important risk factor for falls and for injuries, and can be justified by the natural aging process, which leads to structural and functional changes, such as decreased muscle strength and elasticity, as well as changes in the sensory and nervous system[11]. Regarding gender, women in the age group of 70 to 79 had a higher risk of falling. A study conducted in a hospital in Portugal identified a higher percentage of women classified with a higher risk for falls[12].

People who attended school had a higher risk of falls and according to Mini Mental State Examination, it was evidenced that schooling is directly related to the risk of falls, as proved by the significant results ($p < 0.01$) from the crossing of the Morse scale with the sociodemographic data shown in table 2. A study carried out with 1,451 elderly people living in the South of Brazil found that the prevalence of falls was higher in those with four to seven years of schooling[13]. It is believed that these results were highlighted by the fact that many individuals attended school for a short time, but did not master reading and writing, and were considered non-literate. In addition, even though they have educational levels and claiming to understand the risks, the elderly neglect their health care, not applying the guidelines of the multiprofessional team for the prevention of falls.

Regarding the classification of the risk of falls, the results indicated that 45% of hospitalized elderly who were part of this study had a high risk for falls, followed by 39.4% with medium risk. Corroborating with these data, a study done with hospitalized elderly people in a public hospital in Belém/Pará, identified a high risk for evaluating falls in the majority of the elderly in the sample (52.0%)[14].

In the detailed analysis of Morse Scale items, it was observed that in the historical item of falls 53.2% reported not suffering from this episode in the last year, considering a positive factor of the sample studied. It was verified in another study that elderly people who had previous falls in the last 6 months are 1.675 times more likely to fall than those who did not experience these events[15].

The items that obtained a higher percentage of elderly patients with higher risk associated with the fall were secondary diagnosis (80.3%) and use of intravenous therapy (67.3%). Corroborating these data, the study showed a similar result in that among those investigated, these two items also prevailed (60.9% and 92.8%, respectively)[16]. It is known that these two items are directly related to the use of medications, another strong factor that increases the risk of falls, directing the importance of preventive measures that address these conditions.

Favorable points are highlighted in the aid items in walking and mental state, since the majority of the elderly indicated zero in both, i.e., elderly people who do not need walking aids and are guided by their limitations. Moreover, it is attentive to a representative of elderly people with weak and committed march (32.85%). These individuals are more likely to fall due to their limitations and difficulties related to locomotion and balance, necessitating greater nursing care and thus avoiding potential damages.

The appearance of chronic diseases with the advancing age favors the consumption of medicines by the elderly. Given the classes of medications and their relation to the risk of falls, it was observed a significant difference in the use of diuretics. A study developed with 317 elderly people, 80.8% used diuretics and of these 50.4% reported falls in the last 12 months[17].

The use of diuretics causes fatigue and/or hydroelectrolytic disturbance, which leads to volume depletion and hypocalcemia, consequently, orthostatic hypotension and arrhythmias, favoring the occurrence of falls[18]. In addition, the use of this medicine causes nocturnal awakenings frequent for urination, causing the elderly to have to lift more times, which can lead to falls and fractures.

When analyzing the health conditions and morbidities associated with falls, it was verified that the elderly with uri-

nary incontinence, visual deficit and heart failure are more likely to fall. Research conducted to identify predictors of falls in the elderly also identified urinary incontinence as a strong factor to cause falls in the hospital context[19]. This relationship is due to the need for the elderly to urinate more often, causing an increase in the frequency of going to the bathroom, also in the night shift, exposing him to the greater risk of falls.

The visual deficit is one of the alterations due to the aging process that causes reduction of the postural stability, propitiating the occurrence of falls. A study carried out with 556 hospitalized patients associated the visual deficit with the occurrence of falls, noting that of those who fell 88.6% had this condition[13]. Also, the relationship between heart failure and the risk of falls is highlighted. It is believed that this compatibility is due to the exacerbated use of cardiovascular medicines consumed by the affected elderly, which trigger side effects such as bradycardia, hypotension, drowsiness and fatigue, contributing to the high occurrence of falls in patients with heart problems. Corroborating this information, a study conducted to evaluate the prevalence and factors associated with the occurrence of falls in the elderly, highlighted the cardiac problems as one of the most prevalent pathologies to cause falls[11].

In the face of the risks that the elderly are exposed during the hospital stay, it is emphasized the importance of companion and/or family member as a great ally in the prevention of falls, especially in those at high risk. According to the Statute of the Elderly, all patients with 60 years or more is entitled to the presence of a companion in his time in public or private hospitals[20].

Thereby, it is essential the commitment of the entire health team with the monitoring and control of health/disease conditions that affect the elderly, being attentive to guide the accompanying participation, if necessary, seeking to identify the intrinsic and extrinsic risk factors so that they can plan and execute preventive measures that reduce the risk of falls, always seeking improvement for patient safety and qualification in the assistance provided.

CONCLUSION

The study evaluated the risk of falls in hospitalized elderly people according to the Morse scale, showing that 45% of the participants presented a high risk of falls.

The results found will assist the health team in planning actions that enhance patient safety, as well as improving the knowledge for clinical practice about issues related to falls in the hospital environment, reinforcing the importance of using a tool in identifying elderly patients at risk.

It is suggested that a training for health professionals should be planned, as well as new research and teaching strategies on the subject presented, in order to work on the practice of using fall risk assessment scales and elucidate this problem in hospitalized elderly. With this, there will be an improvement in the quality of the training of health professionals, as well as the level of evidence for the assistance provided to this.

As a limitation of the study, it should be pointed out that the results can not be generalized to all hospital contexts, since only four hospitalization units were investigated. However, provide data that support preventive measures for falls, seen as one of the major security incidents is indispensable not only for the welfare field, but also to thrive other research, teaching and management.

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