

## THE ASSOCIATION BETWEEN NURSING DIAGNOSES AND THE OCCURRENCE OF FALLS OBSERVED AMONG ELDERLY INDIVIDUALS ASSISTED IN AN OUTPATIENT FACILITY

Marcia Duarte Moreira<sup>1</sup>  
Andréa Rodrigues Costa<sup>2</sup>  
Letícia Rodrigues Felipe<sup>3</sup>  
Célia Pereira Caldas<sup>4</sup>

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*This is an exploratory descriptive study with a quantitative approach, in which variables associated to the occurrence of falls observed in elderly assisted in an outpatient clinic are delineated from the nursing diagnoses. Data from the files of 490 elderly with age between 60 and 98 years old were investigated. Univariate and bivariate statistical analyses were performed ( $p < 0,05$ ). The dependent variable, occurrence of falls, was prevalent in 30% of the cases and occurred with more frequency among females. A positive and independent association with the following diagnoses of Nursing was found: loss of balance ( $p < 0,001$ ), high blood pressure ( $p < 0,001$ ), weakness ( $p < 0,025$ ) and urinary incontinence ( $p < 0,025$ ). No association was observed for: altered vision, altered audition, joints pain, altered march and postural hypotension. The study shows the importance of working issues related to the variables that presented positive association with the occurrence of falls in the nursing practice.*

**DESCRIPTORS:** aged; accidental falls; nursing diagnosis

## VARIABLES ASOCIADAS CON LA OCURRENCIA DE CAIDAS A PARTIR DEL DIAGNÓSTICOS DE ENFERMERÍA EN ANCIANOS ATENDIDOS AMBULATORIALMENTE

*Estudio descriptivo - exploratorio con enfoque cuantitativo, en el cual son mencionadas variables asociadas con caídas de ancianos atendidos ambulatoriamente, en base a los diagnósticos de Enfermería. Fueron investigados los registros de informaciones de las historias clínicas de 490 personas ancianas a partir de 60 años. Fue utilizado el análisis estadístico univariado y bivariado ( $p < 0,05$ ). La variable dependiente - ocurrencia de caídas - tuvo una prevalencia de 30%, siendo mayor en el sexo femenino. Se encontró una asociación positiva e independiente con los siguientes diagnósticos de enfermería: pérdida de equilibrio ( $p < 0,001$ ), presión arterial alta ( $p < 0,001$ ), debilidad ( $p < 0,025$ ) e incontinencia urinaria ( $p < 0,025$ ). No se observó asociación entre las caídas y los siguientes diagnósticos: visión alterada, audición alterada, dolores osteo-articulares, marcha alterada e hipotensión postural. El estudio demuestra la importancia de ser trabajados por enfermería aspectos relacionados con las variables que presentan asociación directa con las caídas.*

**DESCRIPTORES:** anciano; accidentes por caídas; diagnóstico de enfermería

## VARIÁVEIS ASSOCIADAS À OCORRÊNCIA DE QUEDAS A PARTIR DOS DIAGNÓSTICOS DE ENFERMAGEM EM IDOSOS ATENDIDOS AMBULATORIALMENTE

*Trata-se de estudo descritivo exploratório com abordagem quantitativa, no qual são delineadas variáveis associadas à ocorrência de quedas nos idosos atendidos ambulatorialmente, a partir dos diagnósticos de enfermagem. Foram investigados os registros de dados dos prontuários de 490 idosos a partir de 60 anos. As variáveis sofreram análise univariada e bivariada ( $p < 0,05$ ). A variável dependente - ocorrência de quedas - obteve prevalência de 30% com maior proporção no sexo feminino. Foi encontrada associação positiva e independente com os seguintes diagnósticos de enfermagem: perda de equilíbrio ( $p < 0,001$ ), pressão arterial elevada ( $p < 0,001$ ), fraqueza ( $p < 0,025$ ) e incontinência urinária ( $p < 0,025$ ). Não se observou associação entre quedas e os diagnósticos: visão alterada, audição alterada, dores osteoarticulares, marcha alterada e hipotensão postural. O estudo demonstra a importância de se trabalhar melhor as questões relativas às variáveis que apresentaram associação positiva com a ocorrência de quedas, na abordagem de enfermagem.*

**DESCRITORES:** idoso; acidentes por quedas; diagnóstico de enfermagem

<sup>1</sup> RN, resident at University of Rio de Janeiro, e-mail: marcia\_uerj@hotmail.com; <sup>2</sup> RN, resident of the Institute Fernandes Figueira; <sup>3</sup> RN; <sup>4</sup> Advisor, Professor at University of State of Rio de Janeiro College of Nursing, e-mail: ccaldas@uerj.br

## INTRODUCTION

This study originated from the outpatient practice at the Care Nucleus for Elderly Patients (NAI) of the University Open to the Elderly (UNATI) of Rio de Janeiro State University (UERJ). In filling out patient files in the nursing consultation process, we detected the need for a Nursing\* diagnosis coding system, with a view to improving care planning.

A literature review revealed that Nursing diagnosis coding systems did not cover all problems related to elderly care. This happens because these systems mainly focus on young adults.

Among several diagnoses systems considered in our previous study<sup>(1)</sup>, the CIPE-alpha version (International Classification for Nursing practice) was considered the best system available to meet elderly patients' needs. Even so, many Nursing problems did not have a diagnosis. Because of this demand, in 2004, an adaptation of the CIPE-alpha version directed to the elderly was created, in order to support the detection process of Nursing diagnoses. This project was supported by the Rio de Janeiro State Research Support Foundation (FAPERJ)<sup>(1)</sup>.

Using this adaptation, a database was created with the Nursing diagnoses of the clientele attended at the outpatient unit. This made it possible to get to know the Nursing diagnosis profile of the elderly attended at the outpatient clinic<sup>(1)</sup>.

Most of the elderly are healthy and lead an autonomous life. However, the increase in life expectancy also increases the incidence and prevalence of chronic and degenerative diseases. This profile of vulnerability to illness leads to processes of progressive loss of autonomy and independence. Examples of these processes are dementia syndromes; iatrogeneses; visual, auditive and cognitive deficits; postural instability, falls and other situations that constitute the group called "geriatric syndromes"<sup>(2)</sup>. To deal with these conditions, it is essential to evaluate the care and self-care of the elderly in order to assure the maintenance and optimization of the elderly's quality of life.

During Nursing consultations at the outpatient clinic, the frequency of diagnoses related to falls was observed. This observation was confirmed through our study<sup>(1)</sup> performed in 2004 and other authors in

the literature<sup>(3-5)</sup>, which demonstrated that the main diagnoses found in the clientele were related to the same situation.

The fall event is part of the geriatric syndrome postural instability and falls. It represents the main cause of disability among the elderly. Falls cannot be looked at in an isolated way, but as a symptom, because they represent the total loss of postural balance.

In order to understand the factors that cause a fall, the existing interaction between the vulnerable individual, the elderly, and the environmental factors should be clear. Over time, some factors become more important than others<sup>(4)</sup>.

In studies performed in the United States, falls constitute the main etiology of accidental death among elderly people. In Brazil, according to Medical Information System (MS) data, between 1979 and 1995, around 54,370 people died due to falls, 52% of whom were old people<sup>(5)</sup>.

Although the increase of fall events in the elderly population is evident, gerontology-geriatric literature has performed few epidemiological studies about this theme<sup>(4)</sup>.

Many factors that favor the fall event can be reduced or even avoided if the elderly at risk create awareness about their vulnerability. That is why self-care is so important as the main factor for its prevention.

Starting from this premise, the following research question was established: which are the verifiable variables from Nursing diagnoses that have contributed to the high frequency of falls among the elderly?

This study aims to create support for actions aimed at addressing these shortages correctly and continually, so that both professionals and clients become more active in the care/self-care process.

## MATERIAL AND METHOD

This is a descriptive and exploratory study with a quantitative approach, in which the variables related to the occurrence of falls in elderly outpatients are outlined according to the Nursing diagnoses.

The study was performed at the NAI outpatient clinic of the UnATI/UERJ. Structured on the basis of a

\* In this study, we will use the same definition of nursing diagnoses as in the previous study<sup>1</sup>, which was approved at the 9th Conference of NANDA (North American Diagnosis Association): "a clinical judgment about individual, family or community responses to actual and potential health problems/life processes"

thematic micro-university model, the UnATI/UERJ offers a Community Center for the elderly, a Health Program with two outpatient clinics, a Documentation Center and a Teaching and Graduate Program. The NAI is one of the outpatient clinics of the Integral Elderly Health Care Program at UnATI<sup>(6)</sup>.

Falls are the dependent variable of this study, being defined as the non-intentional dislocation of the body to an inferior level in relation to the initial position, with incapacity to correct it in due time, determined by multifactorial circumstances and affecting stability<sup>(7)</sup>.

Three sets of independent variables were considered: the first is composed of the gender and age variables. The Nursing diagnoses that, according to literature<sup>(3-5)</sup>, can contribute to the occurrence of falls and present high occurrence levels in the study population are: loss of balance, postural hypotension, altered vision, auditive alteration, bone and joint pains, altered walking, high blood pressure and urinary incontinence. These constitute the second set. The third set is the number of drugs used by the attended clientele. Literature appoints this variable as important for the occurrence of falls in elderly people<sup>(5)</sup>.

The target population included the 1,652 elderly (men and women over 60) who attend the NAI outpatient clinic. A sample correspondent to 490 files (29.66%) was selected. The method used to correct the sample selection bias was restriction: only clients whose Nursing consultation was complete and registered on their files were included in the study. To study the association study between the number of drugs used by the clientele and the occurrence of falls, a random sub-sample of 100 files was selected.

The clients' Nursing diagnoses were recorded in a computer database in the Microsoft Access Database Management System.

Univariate analysis was performed, including the quantitative variables compared between one group with a history of falls and another that did not suffer falls. The variables referring to Nursing diagnoses were subject to bivariate analysis and were compared through Pearson's Chi-square ( $X^2$ ) test, considering associations with  $p < 0.05$  as significant.

Regarding the characteristics of the study group, these were found compatible with the distribution of sociodemographic characteristics in Brazil. There are 374 women (76.4%), that is, almost three times more women than men – 116 (23.6%).

According to data by the Brazilian Institute of Geography and Statistics (IBGE)<sup>(8)</sup>, women represent approximately 60% of the elderly population in the country.

The age range was 60 years and older, with a higher incidence in the range from 70 to 79 years old – 248 (54.4%). There are 110 (24.1%) people between 60 and 69 years old and 132 (28%) over 80. The mean age is 79 years. According to data from the last census, in the last decade, the subgroup over 75 years old has experienced larger growth<sup>(8)</sup>.

Regarding marital status, most subjects are divorced, single or widowed – there are 160 (65.6%) people, 107 (43.9%) of whom are widowed. Eighty-four (34.4%) are married. Patient files for more than half of the attended clients (50.2%) do not mention their marital status. Despite this lack of information, results follow the national tendency. Data from the 1995 National Household Survey (PNAD) demonstrated that 56% of the elderly are widowed<sup>(9)</sup>.

Almost half of the subjects (more than 45%) have only taken elementary education (unfinished basic education). Fifty participants are illiterate (11.1%) and only 26 (5.8%) with higher education. There are 102 (22.6%) people who finished basic school and 68 (15%) who finished secondary school. According to IBGE data, approximately 65%<sup>(9)</sup> of the elderly have only taken elementary education.

Regarding income, the national minimum wage (MW) of R\$ 260.00 was used, referring to the month and year of data collection. In this sample, the majority gains up to five MW – 167 (80.3%). There are 31 (14.9%) people who receive between five and ten MW and only ten people (4.8%) more than ten MW. These results demonstrate the general tendency of the country in 2000: the majority of the Brazilian elderly possess an average income of up to one MW<sup>(9)</sup>.

## RESULTS

From the 490 medical files studied, 137 belonged to the group of elderly with a history of at least one fall event, totalizing 27.9%, while the remaining 353 (72.1%) are from the group with no history of falls in their patient files during the period. This produces a total of approximately 30% of patient files with occurrence of falls in the study population according to the criteria assumed in this study (Table 1).

Table 1 – Prevalence of falls in elderly attended at the Care Nucleus for Elderly Outpatients

Falls	F	%
Yes	137	27,9
No	353	72,1
<b>Total</b>	<b>490</b>	<b>100,0</b>

Demographic Variables according to gender and age

We can perceive in Table 2 that, in the sample of 490 files, 116 elderly were men (23.6%), while the large majority, totaling 374 elderly, was women (76.4%).

Table 2 - Distribution of study sample according to gender and occurrence of falls in 2004

Gender	Falls		No-Falls		Total
	n	%	n	%	
Male	21	18,1	95	81,9	116
Female	116	31	258	69	374
<b>Total</b>	<b>137</b>	<b>27,9</b>	<b>353</b>	<b>72,1</b>	<b>490</b>

The average age of the elderly selected for the sample studied is in the range of 75 years old, data highlighted on table 3.

Table 3 – Mean age according to gender of elderly victims of falls at the Care Nucleus for Elderly Outpatients in 2004

Gender	Mean (years)	Total Mean
Man	75,3	79,2
Woman	83,2	

Nursing diagnosis Variables

In the two studied groups, we compared those Nursing diagnoses which, according to literature and corroborated by a previous study<sup>(1)</sup>, were relevant for the occurrence of falls in elderly people attended at the outpatient clinic.

In the performed distribution, all diagnoses obtained frequencies capable of undergoing bivariate analysis, with a view to assessing their significance. One exception was postural hypotension, with only two occurrences (1.4%) of fall events and no occurrence in the group of elderly fall victims.

An increase in the prevalence of falls is observed as the number of Nursing diagnoses increases. In the group who suffered at least one fall event, there are 3.5 diagnoses per person, against 2.7 diagnoses per person in the group without fall events.

Table 4 shows the prevalence of Nursing diagnoses among elderly patients with a history of

falls and the group without falls. This table also shows the results of the bivariate analysis of the Nursing diagnosis variables in the sample.

In accordance with the adopted criterion for significance ( $p < 0.05$ ), significant associations were found between the occurrence of falls and the variables: loss of balance, high blood pressure, weakness and urinary incontinence.

Table 4 - Distribution of Nursing diagnoses among elderly patients with and without a history of falls in 2004\*

Diagnoses	Falls		No-Falls		X <sup>2</sup>	P value
	N	%	N	%		
Loss of balance	48	35	64	18	15,05378	<0,001
High BP	73	53,2	115	32,5	17,030832	<0,001
Altered vision	90	65,6	216	61	0,672378	NS
Auditive alteration	50	36,4	102	28,8	2,321522	NS
Bone and joint pains	95	69,3	230	65,1	0,598633	NS
Altered walking	22	16	35	9,9	3,050593	= 0,1 > 0,05
Weakness	39	28,4	65	18,4	5,3802	<0,025
Urinary incontinence	34	24,8	52	14,7	6,259554	<0,025-
Postural hypotension	2	1,4	0	-	-	-

\*Table constructed from the number of diagnoses and not from the number of subjects  
 NS – Not significant; P-significance level; X<sup>2</sup> Pearson's Chi-square Test

The variable altered walking was close to the significance limit and was not included in the group of significant variables.

As we can observe in the same table, the variables: altered vision, auditive alteration and bone-joint pains, did not present significant associations with the occurrence of falls in the attended elderly, according to the adopted criterion.

Number of drugs used

When looking at the number of drugs used and the occurrence of falls, the data obtained in the random sub-samples of the two studied groups (totalizing approximately 100 elderly) show that the history of falls among people who took four or more drugs was inversely proportional to that among people who took up to three drugs. This demonstrates the important contribution of this variable to increase the susceptibility to falls in this clientele (Table 5).

Table 5 – Number of drugs used in a random sub-sample at the Care Nucleus for Elderly Outpatients in 2004

Drugs	Falls		No-Falls		Total
	F	%	F	%	
Up to 3	15	27,2	40	72,8	55
4 or more	32	71,2	13	28,8	45
<b>Total</b>	<b>47</b>	<b>47</b>	<b>53</b>	<b>53</b>	<b>100</b>

## DISCUSSION

This study identified a percentage of approximately 30% of falls in the sample of patient files correspondent to the elderly attended at the outpatient clinic in 2004. The authors of a study performed in 2000, found falls prevalence levels of 30.9% and 29.1%, respectively, suggesting similar values to our results<sup>(10)</sup>.

The female gender variable, with 76.4% of the total sample, revealed to be significant for the occurrence of falls in the study group.

Corroborating our results, authors<sup>(5,11)</sup> in 2004 confirm that the female gender is a very important variable for falls. Other findings<sup>(10)</sup> report that the risk of falls increased approximately 1.8 times among female elderly in comparison to the male gender.

Considering the gender factor, falls occur more frequently among women due to their higher longevity and to osteoporosis. Osteoporosis is particularly frequent in elderly, mainly women, after the menopause. As hormonal production guarantees a protection effect, its reduction generates a loss of calcium<sup>(4,12)</sup>.

The predominant age range in this study is very significant for the occurrence of falls, as elderly from the age of 75 onwards are more susceptible to diseases and to the effects of several drugs. Thus, histories of falls are more common as a result of the association among multiple interconnected factors<sup>(4)</sup>.

A study<sup>(13)</sup> from 1988 among elderly of at least 75 years old demonstrated that 32% of them had already experienced falls - a very significant percentage.

Regarding the nursing diagnoses and the occurrence of fall events in the studied group, the diagnosis postural hypotension did not obtain a sufficient frequency for further analysis, although authors<sup>(3,5)</sup> believe that postural hypotension contributes to the occurrence of falls in the elderly.

Most studies<sup>(13)</sup> did not find relevant associations between falls and postural hypotension, obtaining a frequency of less than 10% of that observed in other groups. This result can derive from the little importance given to the study of this variable. Few studies have directly analyzed postural hypotension with a history of falls and, although this variable was not considered significant in the results of this study, its importance should be considered.

Through the results, we can observe an increase in the prevalence of falls as the number of

nursing diagnoses increases. The risk of falls significantly increases with the number of risk factors, suggesting the importance of the accumulation of multiple disabilities<sup>(13)</sup>. Falls are hardly an isolated factor. Thus, it is important to highlight their multifactorial aspect<sup>(5)</sup>.

In the studied group, the nursing diagnoses loss of balance, high blood pressure, weakness and urinary incontinence were significant for the history of falls.

Studies from 2000 and 2004<sup>(11,14)</sup> confirm that equilibrium disorders are significant for the occurrence of falls, highlighting that aging determines slower answers by the elderly, generating disequilibrium. In order to compensate for this deficit, the elderly tend to take shorter steps to find their gravity center, but without success, which can generate the fall.

Another study<sup>(10)</sup> demonstrates that elderly with equilibrium abnormalities presented two to four times more chances of falling. After they suffered the first fall, this chance increases to 3.7 times.

Regarding high blood pressure, specialists<sup>(4)</sup> emphasize that any heart disease, including abnormal pressure, which causes the reduction of cerebral perfusion, can expose the elderly to the risk of falling. Several authors<sup>(5,10,14)</sup> appoint this variable as significant, corroborating the findings of this study.

Weakness, another significant variable in the results, was also evaluated in a study from 2004<sup>(11)</sup> with hospitalized elderly, which indicates that complaints of muscle weakness in the lower limbs and weakness in hand shaking are among the most common associated factors. The causes of weakness can be due to inadequate eating habits, anemia, iatrogenic effects of drugs, besides neurological problems. A detailed evaluation of these factors is necessary to prevent falls and possible aggravation of the elderly's health state<sup>(11)</sup>.

The last variable with significant association was urinary incontinence. Authors highlight it as a very heterogeneous problem, with a negative impact on many patients' physical and psychological health, being a limiting factor<sup>(2)</sup>.

Among activities commonly related to falls in the domestic environment, "getting on or off the toilet" is one of the most prevalent<sup>(4)</sup>. No study was found that evaluates this variable in association with the occurrence of falls, but it is important to consider its importance in outpatient practice.

Although the diagnosis altered walking has not been included in the group of significant diagnoses

for the occurrence of falls in the elderly under study, due to a series of characteristics, elderly patients deserve a more judicious evaluation regarding falls and, among these, altered walking is very important.

A research carried out in the year 2000 demonstrated that 50% of falls occur while walking. However, there are few studies evaluating this variable<sup>(10)</sup>. That study showed that 57% of the elderly victims of falls presented walking difficulties. Elderly with walking abnormalities presented 2.6 more episodes of falls and 5.3 more chances of recurrent falls than those who did not present such alterations<sup>(10)</sup>.

We have not found studies with similar results regarding the relation between altered walking and falls. It is possible that this variable has not been adequately evaluated during the Nursing consultation, since there are no significant data about it. This consideration calls attention to the importance of better assessing this variable and its potential for the occurrence of falls.

According to the adopted criterion, the following nursing diagnoses were not significant for the occurrence of falls in the studied group studied: altered vision, auditive alteration and bone-joint pains.

In line with these results, another study<sup>(13)</sup> did not consider sight disorders as risk factors for falls, although authors<sup>(2,5,10)</sup> have given importance to this variable. Even so, they appoint the importance of visual problems as predictors of falls in elderly.

According to a study carried out in 2000, elderly with low, moderate and severe reduction of visual acuity present twice more chances of falling; those with reduced contrast sensitivity have 1.1 times more chances to fall; and those with abnormalities in the visual field have 1.5 times more chances of falling.

Auditive deficiencies are factors that can trigger psychosocial problems and interfere in walking and in the number of accidents<sup>(4-5)</sup>. No studies were found with statistically significant values that confirm the importance of hearing for the occurrence of falls, although literature shows this variable as having an important contribution<sup>(4)</sup>.

The last non-significant nursing diagnosis we assessed was bone-joint pain. As opposed to our findings, authors<sup>(10)</sup> mention that diseases causing back problems, such as disk diseases and osteoarthritis, create difficulties to perform several activities, favoring a higher tendency to fall.

Bone-joint pains are caused by several pathologies and hinder the performance of several

complex and simple activities, hampering the elderly with mobility reduced by non-use and equilibrium<sup>(4)</sup>.

As some variables which are more prevalent in the study population - in this case, a population of elderly in which bone-joint pains and altered walking are common, were not able to discriminate the risk of falls, although they are appointed as important factors in literature.

The last variable evaluated by the study was the number of drugs and the history of falls among elderly in the study sample. The iatrogenic effects of the drugs can be relevant factors for the risk of fall in the elderly<sup>(2,5)</sup>.

Studies have demonstrated that the suspension of these drugs results in a 39% reduction in the rate of falls. The following drugs are related with falls: sedative, antipsychotic, antidepressants, anticonvulsants, cholinergic antagonists, anti-arrhythmia agents, diuretics and hypoglycemics; besides the association of more than four pharmaceutical agents (polypharmacy concept)<sup>(5)</sup>. On the contrary, findings<sup>(10,11)</sup> from 2000 and 2004 evaluated the variable "number of drugs" and did not find significance for the occurrence of falls.

The study demonstrates the importance of better addressing issues related to falls and correlated factors in health professionals' approach of the elderly.

The study presented some limitations, such as the lack of evaluation of environmental effects in the context of the occurrence of falls, because this variable could not be addressed on the basis of the database. Some behavioral aspects of clients should be assessed, besides their perception of their health-disease process.

We highlight the importance of a more accurate evaluation of the occurrence of falls and correlated factors, most of which can be addressed and minimized.

This study aims to call attention to the importance of falls as a public health problem, in line with the guidelines established by the National Elderly Health Policy (1999), which stimulates discussions and studies in geriatrics and gerontology.

Educative actions about the theme must be emphasized to create a more critical view in clients regarding the importance of this event, stimulating their responsibility and self-care. These actions can be executed through waiting room strategies or during consultations, taking the form of orientations, in order to address the theme and perform prevention activities.

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