

# RISK FOR FALLS IN PATIENTS IN THE POSTOPERATIVE PERIOD

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**ABSTRACT:** The study aimed to identify the Risk for falls nursing diagnosis and the main risk factors in patients in the postoperative period, at a university hospital. This was a descriptive, cross-sectional study with a quantitative approach. Data were collected from October to December 2012, using a structured script to investigate the sociodemographic and clinical data. Of the 80 patients investigated, 86.25% presented the Risk for Falls Nursing Diagnosis. The risk factors that stood out were: history of falls, postoperative conditions, use of narcotics and/or opiates and use of antihypertensive medication. Given the diversity of risk factors found in patients in the postoperative period, the early identification of these factors by health professionals is imperative, in order to propose preventive and effective actions that suppress or minimize such risks.

**DESCRIPTORS:** Nursing; Accidental falls; Nursing diagnosis; Perioperative nursing.

## RISCO DE QUEDAS EM PACIENTES NO PERÍODO PÓS-OPERATÓRIO

**RESUMO:** O estudo objetivou identificar o diagnóstico de enfermagem Risco de quedas em pacientes no período pós-operatório, internados em um hospital universitário e os principais fatores de risco nesta clientela. Trata-se de um estudo descritivo e transversal de caráter quantitativo. Dados coletados de outubro a dezembro de 2012, por meio de roteiro estruturado para investigar os dados sociodemográficos e clínicos. Dos 80 pacientes investigados, 86,25% apresentaram o Diagnóstico de Enfermagem Risco de quedas. Os fatores de risco que mais se destacaram foram: história de quedas, condições pós-operatórias, uso de narcóticos e/ou opiáceos e uso de anti-hipertensivos. Diante da diversidade de fatores de risco, encontrados em pacientes no período pós-operatório, torna-se imperativo a identificação precoce desses por profissionais de saúde, a fim de propor ações preventivas e eficazes que suprimam ou minimizem tais riscos.

**DESCRIPTORIOS:** Enfermagem; Acidentes por quedas; Diagnóstico de enfermagem; Enfermagem perioperatória.

## RIESGO DE CAÍDAS EN PACIENTES EN EL PERIODO POSOPERATORIO

**RESUMEN:** El estudio tuvo la finalidad de identificar el diagnóstico de enfermería Riesgo de caídas en pacientes en el periodo posoperatorio, internados en un hospital universitario y los principales factores de riesgo en esta clientela. Es un estudio descriptivo y transversal de carácter cuantitativo. Datos fueron recogidos de octubre a diciembre de 2012, por medio de guión estructurado para investigar las informaciones sociodemográficas y clínicas. De los 80 pacientes investigados, 86,25% presentaron Diagnóstico de Enfermería Riesgo de Caídas. Los factores de riesgo que más se destacaron fueron: historia de caídas, condiciones posoperatorias, uso de narcóticos y/o opiáceos y uso de antihipertensivos. Delante de la diversidad de factores de riesgo en pacientes en el periodo posoperatorio, es imperativa la identificación precoz de esos por profesionales de salud, a fin de proponer acciones preventivas y eficaces que supriman o minimizen tales riesgos.

**DESCRIPTORIOS:** Enfermería; Accidentes por caídas; Diagnóstico de enfermería; Enfermería perioperatoria.

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## INTRODUCTION

In recent years nursing care to patients in hospital institutions has required extremely complex practice, in order to offer quality, resolute care. In this sense, patient safety gains relevance and becomes an imperative tool to evoke the scientific capacity of nursing and the commitment to systemic evaluation and prevention actions, in an attempt to enable the reduction of undesired outcomes<sup>(1)</sup>.

In the context of hospitalization, the postoperative period (PO) is considered from the time the patient leaves the operating room until the end of the monitoring by the health team, after their final evaluation. Being a critical stage, extra care from the entire health care team is necessary to ensure safe recovery for this clientele<sup>(2)</sup>.

Hospitalized patients in the postoperative period are subject to various complications, among them the risk for falls. In turn, falls are among the most common adverse events reported in hospitalized patients. This phenomenon becomes common in this population due to the condition of health recovery, the change of environment or even the pharmacological therapy adopted<sup>(3)</sup>.

This adverse event can result in substantial morbidity for the patient and, consequently responsible for the institution<sup>(4)</sup>. Because of this excess morbidity related to falls during hospitalization, the Joint Commission on Accreditation of Healthcare Organizations lists fall prevention programs in hospitals as one of the major patient safety goals. The first step in the creation of a hospital-based fall prevention program, in surgical patients, is to understand the risk factors that cause this adverse event in the postoperative period<sup>(5)</sup>.

Therefore, so that costs, injuries and unwanted harm to patients and professionals are avoided, preventive nursing measures need to be adopted in the short term, in an attempt to reverse this process<sup>(6-7)</sup>. The need arises for organization and operation of the nursing work regarding the method, the staff and the key instruments to carry out the evaluation of individuals related to the risks inherent to safety<sup>(7)</sup>.

For this, it is important to identify the risk factors that contribute to increasing the vulnerability of the individual. Nursing Care Systematization

(NCS), through the Nursing Process (NP) is the methodological tool of reference to identify and prevent such risks<sup>(8)</sup>. From this perspective, the risk for falls can be identified as a nursing phenomenon recognized in the language of its classification systems through the Risk for Falls nursing diagnosis (ND)<sup>(9)</sup>.

This ND is defined as the susceptibility to falls that can cause physical harm. The risk factors that characterize this are arranged as: environment; cognitive; adults; children; physiological; and medication. The ND belongs to the Physical Injury class, a component of the Safety and Protection Domain, which in turn corresponds to the individual being free from danger, physical injury or damage to the immune system, preservation against losses and protection of safety and security<sup>(9)</sup>.

Given the relevance of the theme for nursing, the patients and the institutions, to identify and prevent the risk for adverse fall event, the following guiding question emerged: How is the Risk for falls ND characterized in patients in the postoperative period?

The study aimed to identify the Risk for falls nursing diagnosis and the main risk factors in patients in the postoperative period, in a university hospital.

## METHODOLOGY

This was a descriptive cross-sectional study, using a quantitative approach, developed in a public tertiary teaching hospital located in the municipality of Natal/ Rio Grande do Norte, Brazil. The population consisted of patients in the postoperative period, hospitalized in the clinical surgical units of the hospital.

The sample size was determined from the application of a formula developed for studies with infinite populations that takes into account the confidence level, the prevalence and the sampling error. Therefore, an infinite population, the prevalence of patients treated in the surgical clinical units of the hospital unit, a confidence level of 95% and a sampling error of 5% were considered.

The formula for the sample calculation was as follows:  $N = (Z_{\alpha}^2 \cdot P \cdot Q) / E^2$ , where N= sample size;  $Z_{\alpha}$ = the confidence level; P= prevalence of

patients treated in the surgical clinical units of the hospital;  $Q =$  prevalence complement ( $1 - P$ ); and  $E =$  sampling error. Following the calculation, the sample consisted of 80 patients.

The following criteria were considered for inclusion in the sample: to be hospitalized in the surgical clinical sector of the hospital; to be aged 18 years or over; to be in physical and emotional condition to respond to the questions, and to have undergone the physical examination and have minimum mobility conditions. The sample exclusion criteria were: to present emergency life-threatening situations during the data collection.

The physical conditions correspond to the cognitive ability of the participant, with whom the Mini Mental State Examination (MMSE) was applied by the examining members of the research team. Patients who achieved the following score were included:  $> 15$  (if illiterate);  $> 22$  (for 1 to 11 years of study) and  $> 27$  (for more than 11 years of study). Regarding the emotional conditions, the patients were included as study participants if, and only if, they felt and mentioned being emotionally prepared to take part at the time of data collection.

Data were collected from October to December 2012, through the performance of an anamnesis, a physical examination and consultation of the medical records. For the anamnesis a structured report was used, based on the taxonomy II of the NANDA-I, aiming to obtain sociodemographic and clinical data, as well as information relevant to the risk for falls. With further reference to the medical records, information was extracted regarding the types of medications used and laboratory tests.

The clinical rationale and consequent diagnostic inference followed the judgment process of Gordon(10) which was first performed by the researchers individually for each patient and then carried out by consensus among the researchers to indicate the presence of the Risk for falls nursing diagnosis.

Risk factors for the Risk for falls ND were investigated according to their classification in the NANDA-I, as follows: specific for adults, physiological, and medications. Risk factors unique to children were not included in the present study, as they did not apply to the population of interest. The cognitive factors category was also not included, as the individuals had to present preserved cognitive capacity for inclusion in the study.

A divergence in the interpretations of the researchers regarding the factors related to the environment was perceived, with some making their own observations about the environment, while others asked the interviewee. As this aspect was not standardized in the questionnaire and this limitation was only perceived in the data analysis phase, it was decided to exclude this category from the final result.

Statistical analysis was performed according to the principles of associative and descriptive statistics, obtaining frequencies, means, standard deviation and confidence intervals, as well as the application of the Kolmogorov-Smirnov test to determine the normality of the findings. A confidence interval of 95% and level of significance of  $p < 0.05$  were considered. The data were statistically analyzed using specific statistical packages for the following tests: Fisher's exact test, Mann-Whitney test, T-test assuming equal variances, and the Phi coefficient.

The study was approved by the Research Ethics Committee of the Federal University of Rio Grande do Norte under authorization No. 121.028 and CAAE 07614812.6000.5537 registration, in accordance with the provisions of Resolution No. 466/12 of the National Health Council(11). A prior explanation regarding the aims of the work, the implementation of the interview and the physical examination, and a guarantee of anonymity were given to each of the patients. After agreeing to participate in the study, the Informed Consent Form was signing by each participant.

## RESULTS

Among the participants, the Risk for falls ND was present in 69 patients (86.25%). The sociodemographic data related to its occurrence are shown in Table 1 and 2.

As can be observed, the risk for falls was identified more frequently in males (48.75%), with a mean of 50 ( $\pm 15.48$ ) years of age and 6.62 ( $\pm 4.85$ ) years of study. When comparing the characteristics of the sample, the individuals with the ND in question had a higher mean age and family income, as well as less study time. The majority of these patients stated that they lived with a partner (63.75%) and practiced a religion (68.75%). Regarding the referred intensity of pain, the patients who were not diagnosed with the risk for falls had a higher mean level of pain.

Table 1 - Distribution of patients in the postoperative period, according to sociodemographic. Natal-RN, 2013

Variables	Risk for falls				Statistics
	Present		Absent		
	n	%	n	%	
Gender					p= 0,101 <sup>1</sup> Phi= 0,178 (p= 0,112) OR=3,461 (0,695 - 17,221)
Male	39	48,75	9	11,25	
Female	30	37,50	2	2,50	
Total	69	86,25	11	13,75	
Marital Status					p= 0,063 <sup>1</sup> Phi= -0,214 (p=0,056) OR= 0,294 (0,079 - 1,082)
With companion	51	63,75	5	6,25	
Without companion	18	22,50	6	7,50	
Total	69	86,25	11	13,75	
Religion					p= 0,005 <sup>1</sup> Phi= -0,339 (p=0,002) OR= 0,145 (0,037 - 0,567)
Practitioner	55	68,75	4	5	
Non-practitioner	14	17,50	7	8,75	
Total	69	86,25	11	13,75	

<sup>1</sup>Fisher's exact test.

Table 2 - Clinical data and the occurrence of the Risk for falls nursing diagnosis. Natal-RN, 2013

Variables	Risk for falls				Statistics
	Present		Absent		
	n	Média (±DP)	n	Média (±DP)	
Age	69	50 (15,48)	11	31,55 (10,34)	p= 0,000 <sup>1</sup>
Years of study	69	6,62 (4,85)	11	7,55 (5,12)	p= 0,563 <sup>1</sup>
Family income	69	2,37	11	1,90	p= 0,534 <sup>2</sup>
Pain	69	2,04	11	3,36	p= 0,170 <sup>2</sup>

<sup>1</sup> T-test assuming equal variances; <sup>2</sup> Mann-Whitney test;

Concerning the cross between the risk for falls diagnosis and the described sociodemographic data, a significant association was verified with religion (weak association,  $a = -0.339$ ,  $p = 0.005$ ). In this case, the patients that practiced any religion had 86% less chance to present the Risk for falls ND, though, from a clinical point of view, a relationship between these variables was not perceived. The significant association between age and the occurrence of the Risk for falls diagnosis should be highlighted ( $p=0.000$ ).

The following table describes the most prevalent risk factors according to the categories investigated (exclusively in adults, physiological, and medications) and their associative relationship with the Risk for falls ND. The risk factors exclusive for adults are listed in Table 3.

It was observed that the History of falls (20%) and Age over 65 years (15%) risk factors were the most significant in their category. No statistically significant association between the specific risk factors for adults was identified.

Table 4 presents the physiological risk factors. A total of 12 risk factors were identified in this category, with Postoperative conditions (83.8%) and Anemia (33.8%) being the ones that stood out. A statistically significant association between the Postoperative conditions risk factor and Risk for falls DE was also noted (moderate association,  $a = 0.513$ ,  $p = 0.000$ ). This association suggests that patients in the postoperative period have 18 times more chance of developing a risk for falls. If this study considered a 10% significance level, the condition of Anemia and the Risk for falls DE would present a statistically significant association.

Table 3 - Distribution of patients in the postoperative period, according to the specific risk factors for adults and the occurrence of the Risk for falls nursing diagnosis. Natal-RN, 2013

Risk Factors	N	%	IC <sup>1</sup> (95%)	Associative statistics for the Risk for falls ND
History of falls	16	20	11,9 - 30,4	p=0,302 <sup>2</sup> Phi= 0,109 (p=0,330) OR= 2,777 (0,328 - 23,463)
Age over 65 years	12	15	8,0 - 24,7	p=0,146 <sup>2</sup> Phi= 0,168 (p=0,134) OR*
Use of wheel-chair	5	6,3	2,1 - 14	p=0,467 <sup>2</sup> Phi= 0,103 (p=0,356) OR*
Use of assistive devices	2	2,5	0,3 - 8,7	p=0,742 <sup>2</sup> Phi= 0,064 (p=0,567) OR*

ND- Nursing diagnosis; Phi – Phi Coefficient; OR - Odds ratio; OR\* - Undefined odds ratio; 1 CI - Confidence Interval; 2 - Fisher's exact test.

Table 4 - Distribution of patients in the postoperative period, according to physiological risk factors and the occurrence of the Risk for falls nursing diagnosis. Natal-RN, 2013

Risk Factors	N	%	IC <sup>1</sup> (95%)	Associative statistics for the Risk for falls ND
Postoperative conditions	67	83,8	73,8 - 91,1	p=0,000 <sup>2</sup> Phi= 0,513 (p=0,000) OR= 18,375 (4,154 - 81,267)
Anemia	27	33,8	23,6 - 45,2	p=0,057 <sup>2</sup> Phi= 0,208 (p=0,063) OR= 6,046 (0,731 - 50,000)
Impaired physical mobility	20	25	16,0 - 35,9	p=0,555 <sup>2</sup> Phi= -0,021 (p=0,851) OR= 0,871 (0,207 - 3,663)
Impaired balance	16	20	11,9 - 30,4	p=0,070 <sup>2</sup> Phi= 0,200 (p=0,074) OR*
Vertigo when turning the neck	15	18,8	10,9 - 29	p=0,085 <sup>2</sup> Phi= 0,192 (p=0,086) OR*
Visually impaired	11	13,8	7,1 - 23,3	p=0,174 <sup>2</sup> Phi= 0,159 (p=0,154) OR*
Neoplasms	5	6,3	2,1 - 14	p=0,467 <sup>2</sup> Phi= 0,103 (p=0,356) OR*
Lack of sleep	4	5	1,4 - 12,3	p=0,546 <sup>2</sup> Phi= 0,092 (p=0,413) OR*
Decreased strength in the lower extremities	4	5	1,4 - 12,3	p=0,546 <sup>2</sup> Phi= 0,092 (p=0,413) OR*
Vascular disease	4	5	1,4 - 12,3	p=0,546 <sup>2</sup> Phi= 0,092 (p=0,413) OR*

Foot problems	3	3,8	0,8 - 10,6	p=0,637 <sup>2</sup> Phi= 0,079 (p=0,481) OR*
Hearing difficulties	1	1,3	0 - 6,8	p=0,862 <sup>2</sup> Phi= 0,045 (p=0,688) OR*

ND- Nursing diagnosis; Phi – Phi Coefficient; OR - Odds ratio; OR\* - Undefined odds ratio; 1 CI - Confidence Interval; <sup>2</sup> - Fisher's exact test.

Table 4 - Distribution of patients in the postoperative period, according to the types of surgery and the occurrence of the Risk for falls nursing diagnosis. Natal-RN, 2013

Type of surgery	N	%	Associative statistics for the Risk for falls ND
Digestive/urologic	56	70	p= 0,430 <sup>1</sup>
Head and neck	10	12,50	p= 0,135 <sup>1</sup>
Thoracic	8	10	p= 0,697 <sup>1</sup>
Orthopedic	5	6,25	p= 0,467 <sup>1</sup>
Vascular	1	1,25	p= 0,862 <sup>1</sup>

<sup>1</sup> - Fisher's exact test

As a relationship was found between the postoperative condition and the risk for falls, the cross was performed between the type of surgery and the ND in question, as presented in Table 4. However, no statistically significant association was encountered, showing that the relationship found is related to the general status of the patient in the postoperative period and not to the type of surgery itself.

With respect to the medication risk factors shown in Table 5, the majority of the patients (55%) were using narcotics and/or opiates,

followed by the use of antihypertensive agents (43.8%) and ACE inhibitors (21.3%). There was no statistically significant association between the use of narcotics/opiates and the Risk for falls ND. Conversely, a significant statistical association was detected between the use of antihypertensive agents and the Risk for falls ND (weak association,  $a = 0.279$ ,  $p = 0.011$ ). According to the odds ratio, this association indicates that the patients using antihypertensive medications had 9 times more chance of developing a risk for falls.

Table 6 - Distribution of patients in the postoperative period, according to the medication risk factors and the occurrence of the Risk for falls nursing diagnosis. Natal-RN, 2013

Risk Factors	N	%	IC <sup>1</sup> (95%)	Associative statistics for the Risk for falls ND
Narcotics/opiates	44	55	43,5 - 66,2	p=0,156 <sup>2</sup> Phi= 0,150 (p=0,181) OR= 2,413 (0,646 - 9,019)
Antihypertensive agents	35	43,8	32,7 - 55,3	p=0,011 <sup>2</sup> Phi= 0,279 (p=0,013) OR= 9,714 (1,178 - 80,057)
ACE (angiotensin converting enzyme) inhibitors	17	21,3	12,9 - 31,8	p=0,058 <sup>2</sup> Phi= 0,207 (p=0,064) OR*
Diuretics	12	15	8,0 - 24,7	p=0,479 <sup>2</sup> Phi= 0,066 (p=0,555) OR= 1,896 (0,220 - 16,352)
Anxiolytic agents	3	3,8	0,8 - 10,6	p=0,637 <sup>2</sup> Phi= 0,079 (p=0,481) OR*

ND- Nursing diagnosis; Phi – Phi Coefficient; OR - Odds ratio; OR\* - Undefined odds ratio; 1 CI - Confidence Interval; <sup>2</sup> - Fisher's exact test.

## DISCUSSION

Referring to the findings of this study, the literature shows that, in general, when hospitalized the individual presents a particular imbalance in their basic human needs, and this condition is exacerbated by the postoperative condition<sup>(12)</sup>. Patients in the postoperative period often use various hospital devices, such as IV pole, IV line, urinary catheter, urine collection bag and drains, as well as the presence of the surgical incision itself. These factors may hinder walking and performing self-care, and may cause severe consequences for the recovery of the individual, such as falls, highlighted in this study.

Among the patients included in the study 86.25% presented the Risk for falls ND, the majority being male. This finding contradicts the results of a retrospective cohort study performed in Texas<sup>(13)</sup>, in which the proportion of females was higher. Conversely, a prospective observational study that followed the risk factors for falls from the preoperative to the postoperative period highlighted a greater number of males in the study<sup>(14)</sup>. Therefore, seeking the relationship between clinical and behavioral characteristics of the population rather than relating the risk for falls to gender becomes the focus of studies<sup>(7)</sup>.

With reference to the association between religious practice and the chance of presenting a risk for falls, from a clinical point of view, no reason to justify such an association was found in the literature.

Concerning the relationship between age and the Risk for falls ND identified here, a similar relationship was found in a study conducted in the UK, where it was observed that individuals in a higher age group are more exposed to the risk for falls<sup>(15)</sup>. Studies have shown that, when aging, people are more likely to present postural instability, gait changes, and stiffening of the musculoskeletal joints<sup>(16-17)</sup>. The changes undergone due to the advance of age linked to the postoperative condition favor the possibility of a fall event.

Regarding the Risk for falls ND and the risk factors specific to adults, the history of falls factor was highlighted. A study performed to compare the demographic, clinical and functional profiles of institutionalized elderly people with and without episodes of falls, showed that the occurrence of one or more falls in the previous year resulted in an increased recurrence of the event<sup>(18)</sup>.

Regarding the statistically significant association between the postoperative condition and risk for falls ND, according to a cohort study conducted by the University of Colorado<sup>(5)</sup>, the falls of the client in the postoperative period were caused by weakness, loss of balance, and even syncope. This fact denotes a greater relationship between the postoperative condition and the increased vulnerability of the individual to the risk for falls rather than the type of surgery performed.

Another characteristic indicated in the study was the presence of anemia as a predisposing factor for falls. It is known that anemia can be defined as a reduction in the hemoglobin concentration of the blood. This condition may represent an imbalance in the association of oxygen with this component and lead to clinical consequences, such as dyspnea, weakness, lethargy, low tissue perfusion and even mental confusion, considered possible predisposing factors for falls<sup>(19)</sup>.

The results showed that over 50% of the subjects were using narcotic and/or opioid medications. A case-control study<sup>(20)</sup> showed an association between the use of narcotic analgesics and the risk for falls in patients with osteoarthritis. Another highlighted class of medication was the antihypertensive medications. In a study aiming to verify the relationship between medication use and the risk for fractures resulting from falls in elderly people, it was identified that the hypotensive agents can cause postural hypotension, drowsiness, dizziness, and urinary frequency, among other effects, which can lead to fall events<sup>(21)</sup>.

When identifying and comparing other studies on the Risk for falls ND risk factors in patients in the postoperative period, guiding subsidies unite for the development of actions to prevent these undesirable episodes, for example, preoperative guidance projects, providing decreased anxiety and increased comfort and safety for patients undergoing surgical hospitalization, contributing to the reduction of injuries and conservation of the quality of hospital care<sup>(4)</sup>.

## FINAL CONSIDERATIONS

In summary, through the characterization of the Risk for falls ND in patients in the postoperative period, it was noted that the risk factors that

stood out were: history of falls, postoperative condition, use of narcotics and/or opiates, and use of antihypertensive medication. Among these factors, the statistical association between the postoperative condition and Risk for falls ND (moderate association) stood out, as did the association between the use of antihypertensive medication and the ND (weak association).

Given the diversity of risk factors found in patients in the postoperative period, the early identification of these factors by health professionals is imperative, in order to propose preventive and effective actions that suppress or minimize such risks.

This study had some limitations due to the study design itself. The study had a cross-sectional design, which enabled the identification of associations, however, could not establish the causal relationship. Therefore, because this is a risk phenomenon, the performance of further longitudinal studies is suggested, whether prospective or retrospective, in order to establish a causal relationship between these risk factors and the diagnosis and to demonstrate the most important factors associated with fall events. Other studies should also be performed in different scenarios, mainly for the purpose of comparison with the results found in this study.

Another limitation found was related to the identification of environmental factors, as a discrepancy was noticed between the interpretations by the researchers regarding this issue. As this aspect was not standardized in the questionnaire it was decided to exclude this category from the final result. Therefore, the inclusion of this category in future studies is recommended.

Based on these findings, the development and validation of accurate and precise instruments to evaluate the health status of the patient in relation to the risk for falls and to quantify the presence of risk factors in the health status of the individual is also recommended. Thus, nurses may act in a targeted way and focus their actions for the prevention of falls in the postoperative period.

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