Nursing care mapping for patients at risk of falls in the *Nursing Interventions Classification**

MAPEAMENTO DE CUIDADOS DE ENFERMAGEM PARA PACIENTES COM RISCO DE QUEDAS NA *NURSING INTERVENTIONS CLASSIFICATION*

MAPEO DE CUIDADOS DE ENFERMERÍA PARA PACIENTES CON RIESGO DE CAÍDAS EN LA *NURSING INTERVENTIONS CLASSIFICATION*

Melissa de Freitas Luzia[1], Miriam de Abreu Almeida[2], Amália de Fátima Lucena[3]

ABSTRACT

Objective: Identifying the prescribed nursing care for hospitalized patients at risk of falls and comparing them with the interventions of the *Nursing Interventions Classifications* (NIC). **Method:** A cross-sectional study carried out in a university hospital in southern Brazil. It was a retrospective data collection in the nursing records system. The sample consisted of 174 adult patients admitted to medical and surgical units with the Nursing Diagnosis of Risk for falls. The prescribed care were compared with the NIC interventions by the cross-mapping method. **Results:** The most prevalent care were the following: keeping the bed rails, guiding patients/family regarding the risks and prevention of falls, keeping the bell within reach of patients, and maintaining patients' belongings nearby, mapped in the interventions *Environmental Management: safety* and *Fall Prevention*. **Conclusion:** The treatment prescribed in clinical practice was corroborated by the NIC reference.

DESCRIPTORS
Nursing diagnosis
Nursing care
Accidental falls
Inpatients
Hospitalization

RESUMO

Objetivo: Identificar os cuidados de enfermagem prescritos para pacientes hospitalizados com risco de quedas e compará-los com as intervenções da *Nursing Interventions Classifications* (NIC). **Método:** Estudo transversal realizado em um hospital universitário do Sul do Brasil. A coleta de dados foi retrospectiva em sistema informatizado de registros de enfermagem. A amostra se constituiu de 174 pacientes adultos internados em unidades clínicas e cirúrgicas com o Diagnóstico de Enfermagem Risco de quedas. Os cuidados prescritos foram comparados com as intervenções da NIC pelo método de mapeamento cruzado. **Resultados:** Os cuidados mais prevalentes foram: manter grades no leito, orientar paciente/família quanto aos riscos e prevenção de quedas, manter campainha ao alcance do paciente e manter pertences próximos ao paciente, mapeadas nas intervenções Controle do Ambiente: Segurança e Prevenção contra Quedas. **Conclusão:** Os cuidados prescritos na prática clínica foram corroborados pelo referencial da NIC.

DESCRITORES
Diagnóstico de enfermagem
Cuidados de enfermagem
Acidentes por quedas
Pacientes internados
Hospitalização

RESUMEN

Objetivo: Identificar los cuidados de enfermería prescritos para pacientes hospitalizados con riesgos de caídas y compararlos con las intervenciones de la Nursing Interventions Classifications (NIC). **Método:** Estudio transversal realizado en un hospital universitario del sur de Brasil. La recolección de datos fue retrospectiva en un sistema informatizado de registros de enfermería. La muestra se constituyó por 174 pacientes adultos internados en unidades clínicas y quirúrgicas con el Diagnóstico de Enfermería Riesgo de Caídas. Los cuidados prescritos fueron comparados con las intervenciones de la NIC por el método de mapeo cruzado. **Resultados:** Los cuidados más prevalentes fueron: mantener barandas en la cama, orientar al paciente y familia en relación a los riesgos y prevención de caídas, mantener el timbre al alcance del paciente y mantener las pertenencias cerca al paciente. Estos fueron mapeados en las intervenciones Control del Ambiente: Seguridad y Protección contra Caídas. **Conclusión:** Los cuidados prescritos en la práctica clínica fueron corroborados por el referencial de la NIC.

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Pacientes internos
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INTRODUCTION

Falls are one of the major adverse events in hospitals, accounting for two in every five episodes related to patient care[1]. The occurrence of injuries resultant from falls can vary from excoriations and contusions, to fractures and head traumas, and even death. Such damage can cause limitations and physical disability, increase the length of hospital stay, and the costs related to treatment with ethical and legal implications for the institution[2-3]. The repercussions of falls may also be psychological, especially in the elderly, expressed by the fear of falling, insecurity in walking, worsening of functional decline, depression and social isolation[4].

Patient safety is a priority for the World Health Organization (WHO) that launched the World Alliance for Patient Safety in October 2004, aiming to raise awareness for the improvement of safety in health care[5]. Following this trend, in April 2013, the Ministry of Health and the Brazilian Health Surveillance Agency (ANVISA) created the National Patient Safety Program (Programa Nacional de Segurança do Paciente - PNSP) aiming to promote actions for patient safety in health services of the country[6].

The prevention of falls is one of the six international safety goals set by the WHO and also represents one of the safety protocols of the PNSP. There is an apparent concern of nursing in this context, when searching for grants in order to carry out interventions that enable a safer, quality and harm-free care.

One of the strategies has been the use of the nursing process, a systematic and scientifically grounded method of work that guides the care and documentation of professional practice[7], allowing the evaluation of patients and the identification of risk factors for falls. In this clinical situation, nurses can determine the Nursing Diagnosis (ND) Risk for falls[8], aimed at preventing falls through interventions.

The ND Risk for falls of the NANDA International (NANDA-I) is defined as risk for increased susceptibility to falling that may cause physical harm. It is based on risk factors that contribute to increased vulnerability of patients to falls, and has been used as a guide for planning nursing actions preventive of this event[8]. The Nursing Interventions Classification (NIC) on its turn, has priority interventions for this ND in order to establish special precautions for patients at risk of injury due to falling[9].

Several studies, mainly in the context of community, provide evidence that multifactorial interventions are capable of reducing the rate of falls and injuries resulting from the event[10-12]. However, there is a limited number of studies addressing the specific nursing interventions targeted to patients at risk of falling in Brazilian hospital settings[13-15], and with the description of such interventions using a standardized classification system as the NIC[9].

Hence, arose the need to exploit the knowledge of nursing interventions implemented for preventing falls in hospital settings. This study was developed for this reason, aiming to identify the prescribed nursing care for hospitalized patients with the ND Risk for falls and comparing it with the NIC interventions.

The purpose is to explain what nursing has prescribed in the clinical practice of a Brazilian hospital to prevent falls, in addition to making this prescription of care visible by using an international system called *Nursing Intervention Classification* (NIC).

METHOD

This is a cross-sectional study carried out in a university hospital located in southern Brazil, where the nursing process is computerized, the ND follows the NANDA-I terminology[8] and nursing interventions are listed based on the literature, clinical practice and the NIC[9].

The sample consisted of 174 patients, calculated based on a study previously carried out at the institution[16]. The prevalence of the ND Risk for falls was estimated at 13%, the confidence interval of 95% and a margin of error of 0.05.

Inclusion criteria were adults hospitalized in clinical and surgical units of the hospital with the ND Risk for falls in 2011. Patients who had more than one hospitalization during the study period were excluded to avoid repeating data of the same patient.

A retrospective data collection was carried out in the nursing records information system. Data were organized in spreadsheets of the *Excel for Windows*, and the *Statistical Package for the Social Sciences* (SPSS) version 18.0 was used for statistical analysis.

The prescribed nursing care for patients were compared with interventions described in the NIC by the cross-mapping method[17-18].

For reaching this end came the following steps: 1) selection of an NIC intervention for each prescribed nursing care for the ND Risk for falls, considering as a starting point the connection levels between the NANDA-I nursing diagnosis and the NIC interventions (priority, suggested and optional additional); 2) selection of the NIC intervention based on the similarity between the prescribed care and the definition of intervention and its activities; 3) grouping of the prescribed nursing care according to the NIC intervention.

The authors signed a term of commitment for use of data, pledging to use information solely for research purposes, respecting the principles of confidentiality and anonymity. The study was approved by the Committee of Ethics and Research in Health of the institution under Protocol number 110631.

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RESULTS

Prescriptions for 174 patients with ND of Risk for falls were analyzed, with 48 different types in total. The number of prescribed treatments per patient was 4.8±3 on average (Table 1).

The mapping of 48 different nursing care based on the similarity between the prescribed item and the definition of the NIC intervention and its respective activities allowed identifying 13 different interventions of this taxonomy, on the three different levels of connection between the NIC and the NANDA-I[9].

Table 1 – Nursing care prescribed for patients with ND Risk for falls - Porto Alegre, 2012

Nursing Care	N	(%)
Keeping the bed rails	145	83.3
Guiding patients/family regarding the risks and prevention of falls	86	49.4
Keeping the bell within reach of patients	71	40.8
Keeping patient's belongings nearby	56	32.2
Taking vital signs	52	29.8
Assisting in the shower	41	23.5
Sensory assessment	40	22.9
Keeping company during ambulation	36	20.6
Sensory monitoring	33	18.9
Reporting altered level of consciousness	33	18.9
Care implementation with mechanical restraint	32	18.4
Assisting patients in sitting on the chair	27	15.5
Evaluating altered level of consciousness	25	14.3
Maintaining constant vigilance	24	13.7
Assisting in ambulation	22	12.6
Assisting patients in using the bathroom	19	10.9
Reporting signs of pain	17	9.7
Performing bed bath	15	8.6
Inspecting skin in search for hyperemic or ischemic points	14	8.0
Sitting patients on the chair	14	8.0
Making sure that patients/family understood the guidance	14	8.0
Hygiene of the scalp	11	6.3
Assisting in changing clothes	10	5.7
Implementing care of facial hair removal	9	5.1
Guiding patients/family	9	5.1
Teaching the proper use of crutches, walker, cane, prosthesis	9	5.1
Assessing pain using the intensity scale	9	5.1
Removing from the environment objects that may offer risks to patients	8	4.5
Monitoring patients during their mobilization	8	4.5
Performing perineal hygiene after each bowel movement	8	4.5
Reporting complaints of visual changes	7	4.0
Stimulating hygiene care	7	4.0
Observing signs of sedation, slowness	5	2.8
Guiding on ways to adapt to one's limitations	5	2.8
Assisting in feeding	5	2.8
Taking patients to the shower	4	2.3
Assisting in active movements	3	1.7
Offering a wheelchair	3	1.7
Performing body hygiene in the shower	3	1.7
Communicating changes in blood pressure	3	1.7
Assessing pain intensity	3	1.7
Administering analgesia after evaluation	3	1.7
Offering a mobile intravenous drip stand	2	1.1
Evaluating the efficacy of analgesia	2	1.1
Communicating changes during analgesia infusion	2	1.1
Guiding the patients	1	0.5
Explaining the responsibilities for patients/family	1	0.5
Monitoring patient response to medication	1	0.5

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Nursing care and its related correspondence with the priority interventions suggested by the NIC for the resolution or improvement of the ND Risk for falls are described in Chart 1.

Chart 1 – Nursing care actions grouped according to priority interventions suggested by the NIC for the ND Risk for Falls - Porto Alegre, 2012

Type of care mapped	NIC intervention	Level of connection NIC and ND
- Keeping the bed rails - Keeping the bell within reach of patients* - Keeping patients' belongings nearby - Removing from the environment objects that may offer risks to patients*	**Environmental Management: Safety**	**Priority**
- Guiding patients/family regarding the risks and prevention of falls - Making sure that patients/family understood the guidance - Guiding patient/family - Teaching the proper use of crutches, walker, cane, prosthesis - Guiding the patients - Guiding on ways to adapt to one's limitations - Explaining the responsibilities for patients/family - Assisting in ambulation - Keeping company during ambulation - Offering a wheelchair - Monitoring patients during their mobilization - Assisting in active movements	**Fall Prevention**	**Priority**
- Taking vital signs§ - Communicating changes in blood pressure§	**Vital Signs Monitoring**	**Suggested**
- Assisting patients in sitting on the chair* - Sitting patients on the chair - Offering a mobile intravenous drip stand	**Self-Care Assistance: transfer**	**Suggested**
- Assisting patients in using the bathroom	**Self-Care Assistance: Using the toilet**	**Suggested**

* This care is also included in the intervention Fall Prevention.
§ This care is also included in the intervention Surveillance.

Below are described the nursing care and the respective correspondence with the optional additional interventions and those without connection with the ND Risk for Falls, according to the NIC[9] (Chart 2).

Chart 2 – Nursing care grouped according with the optional additional interventions and those without connection between the NIC and the ND Risk for falls - Porto Alegre, 2012

Type of care	NIC intervention	Level of connection NIC and ND
- Assessing pain intensity - Administering analgesia after evaluation - Reporting signs of pain - Evaluating the efficacy of analgesia - Monitoring patient response to medication* - Communicating changes during analgesia infusion* - Assessing pain using the intensity scale	**Pain Management**	**Optional aditional**
- Maintaining constant vigilance	**Surveillance**	**Optional aditional**
- Sensory assessment*§ - Sensory monitoring*§ - Reporting altered level of consciousness*§ - Evaluating altered level of consciousness*§ - Reporting complaints of visual changes* - Observing signs of sedation, slowness*	**Neurological monitoring**	**Unconnected**
- Assisting in the shower - Performing body hygiene in the shower - Performing bed bath	**Bathing**	**Unconnected**

Continued...

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Continuation...

Type of care	NIC intervention	Level of connection NIC and ND
- Taking patients to the shower - Hygiene of the scalp - Performing perineal hygiene after each bowel movement - Implementing care of facial hair removal - Inspecting skin in search for hyperemic or ischemic points	**Bathing**	**Unconnected**
- Care implementation with mechanical restraint	**Physical restraint**	**Unconnected**
- Assisting in changing clothes	**Self-Care Assistance: dressing/grooming**	**Unconnected**
- Stimulating hygiene care	**Self-Care Assistance: bathing/hygiene**	**Unconnected**
- Assisting in feeding	**Self-Care Assistance: feeding**	**Unconnected**

* This care is also included in the intervention Fall Prevention.
§ This care is also included in the intervention Surveillance.

DISCUSSION

This study identified the prescribed nursing care for prevention of falls in the hospital clinical practice mapped with the NIC. The most relevant interventions for patients with the ND Risk for falls, considering number of prescriptions and the number of different care found were: *Environmental Management: Safety* and *Fall Prevention*.

Among the 48 types of prescribed care, 42 were related to factors intrinsic to patients. However, the nursing care of keeping the bed rails, which is related to an environmental condition, had the highest number of prescriptions by nurses.

The *Environmental Management: Safety* intervention, defined as monitoring and manipulation of the physical environment to promote safety[9] included mapping the most frequently prescribed nursing care actions (keeping the bed rails, keeping the bell and belongings close to patients and removing from the environment any object that may offer risks). These care actions are important in preventing falls among hospitalized patients, especially the elderly and patients with physical or cognitive limitations[3].

Somewhat different findings were demonstrated in a study that identified the most frequently used nursing interventions for three groups of hospitalized elderly patients, in which the intervention *Surveillance* was the most frequently prescribed for those with risk for falls[14]. In the present study, the intervention *Surveillance* was used less frequently, showing that nursing care vary in different institutional contexts and are directed to the specific problems and characteristics of patients. This intervention included mapping the care action of maintaining constant vigilance, in addition to other actions of care that could also be mapped in more specific interventions, such as taking vital signs, reporting changes in blood pressure (*Vital Signs Monitoring*) and sensory assessing and monitoring, evaluating and reporting altered levels of consciousness (*Neurological monitoring*). However, it is noteworthy that patient safety is directly related to supervision. This intervention is recommended for preventing falls in hospitalized patients according to

the PNSP guidelines that suggest the periodic monitoring to evaluate the comfort and safety of patients, and the development of mechanisms to supervise those using medications that increase the risk of falls[19].

The condition of hospitalization is knowingly related to increased risk for falls not only by the presence of acute illness, comorbidities and treatments, but also by environmental factors such as height of patients' bed, the inadequacy of the bed rails, lack of support equipment and unfamiliar environment[20-21]. Therefore, it is important to consider environmental issues in both the risk assessment of patients and the strategies for preventing falls.

Problems related to the hospital environment such as high beds and no grids, process failures such as grids that remained lowered and no requests for nursing assistance, were identified in a study that evaluated the risk factors and the incidence of falls in neurosurgical patients in the pre and postoperative periods[22]. The identification of environmental hazards such as the following: slippery or uneven floors; low-light places; periodic checking of conditions of beds; latches; wheelchairs; grab bars; in addition to guidance of patients regarding the use of assistive devices for ambulation, allows detecting priority needs and developing strategies for the prevention of accidental falls[23].

It was found that although the nursing care related to environmental safety correspond to the highest numbers of prescriptions, the greatest diversity of prescribed care is mapped in the NIC intervention *Fall Prevention*, defined as instituting special precautions with patients at risk for injury from falling. Among the 48 different treatments prescribed for patients with ND Risk for falls, 12 were mapped in this intervention, seven targeted the guiding the patients/family and five the assisting and monitoring of ambulation. Besides these, 13 actions of care mapped in other interventions were also included in the intervention I *Fall Prevention*, showing that it covers a variety of activities related to patients and the environment (intrinsic and extrinsic factors) in the prevention of falls.

Studies indicate that multifactorial interventions (using two or more areas of an intervention, in which every

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patient receives a combination of care according to the risk assessment)[10-11] and multiple interventions (using two or more areas of an intervention for all patients), such as the *Fall Prevention,* are capable of reducing the occurrence of falls in hospital settings[24-25]. Once the event has a character of multiple causes, it requires actions focused on the different risk factors identified in patients.

This idea is corroborated by the results of a study carried out in a university hospital in Japan. A reduction in the rate of falls among hospitalized patients was observed with the use of a multidisciplinary fall prevention program based on interventions such as: risk assessment by instrument, protocol implementation, modifications for environment safety and education of patients/family and staff[25].

The intervention *Fall Prevention*, according to the NIC includes ten activities related to guidance and education of patients/family. In nursing prescriptions for patients with ND Risk for falls this type of care was also identified, highlighting that 'guiding patients/family regarding the risks and prevention of falls' was the second most frequently prescribed care by nurses. This care is also included in the preventive actions of the Protocol for Prevention of Falls/PNSP, which recommends adopting educational strategies involving patients and family about the risk of falls, and prevention measures at admission and throughout patients' stay in hospital[19].

The other care prescribed by nurses related to orientation/education were: making sure that patients/family understood the guidance; guiding patients/family; teaching the proper use of crutches, walker, cane and prosthesis; guiding the patients; guiding on ways to adapt to one's limitations and explaining the responsibilities for patients/family.

The guidance of patients and families to understand the presence of risk and fall prevention measures must be a commitment of the healthcare team. Patients need to understand these as really important issues for their safety, because in most times they do not see themselves as vulnerable to the event, and therefore do not adhere to recommendations for prevention[26].

Implementing effective interventions for reducing falls is a challenge due to the complexity of the event. Ideal approaches involve interdisciplinary collaboration, attention to coexisting medical conditions, environmental monitoring and risk reduction, i.e., considering intrinsic and extrinsic factors to patients[4,23-24].

Among these factors, it was found that neurological changes (intrinsic factors to patients) and the nursing activities directed to these conditions constituted the third most prevalent grouping of prescribed care for patients with the ND Risk for falls included in the intervention *Neurological monitoring*. According to the NIC, this intervention

has no connection with the ND Risk for falls, but the literature indicates neurological problems as major risk factors for falls[1,16,27]. In the present study, the prevalence of prescribed care for patients related to the neurological assessment corroborates the literature, and demonstrates that this intervention is important for preventing falls in hospital settings.

The main cognitive functions responsible for balance and posture are attention, orientation, and memory. When limited by neurological changes, they lead to impairments in adaptation to the environment, of judgement, and in the performance of activities that may pose a risk for falls[28]. Thus, it is important to carry out a neurological assessment of patients, identify changes related to increased risk for falls, and to establish the most appropriate preventive measures to the condition of each one.

Neurological diseases can cause scenarios of psychomotor agitation and aggressiveness, especially during hospitalization, which lead to the need to install measures that prevent them from causing any damage to themselves and the team[29]. One of such measures is the physical restraint, a technique widely used in clinical practice, but also discussed among health professionals and the family, since issues such as the patient's dignity and psychological impact are addressed. Although there is no scientific evidence on the real benefits and risks of this conduct, it is critical to do an accurate assessment of the patient's condition based on clinical judgment, the involvement of the multidisciplinary team and, whenever possible, of the family[30].

In the present study, these issues may be related to the low prevalence of the intervention *Physical restraint*, which included the nursing care of 'care implementation with mechanical restraint' in 32 prescriptions (3.3%). The use of physical restraint is done to prevent falls in agitated, semiconscious, unconscious or demented, patients as well as in those addicted or with withdrawal syndrome, and should be performed in a humane manner, according to the recommendations of institutional protocols and legal parameters[31].

Some prescribed nursing care not directly aimed at preventing falls was identified, such as in the intervention *Bathing* (performing bed bath, hygiene of the scalp, implementing care of facial hair removal and inspecting skin in search for hyperemic or ischemic points), *Self-Care Assistance: bathing/hygiene* (stimulating hygiene care) and *Self-Care Assistance: feeding* (assisting in feeding). Such interventions have no direct link with the ND Risk for falls according to the NIC[9]. However, these care may have been prescribed by patients' needs to get help because of their dependence and impaired ability to perform self-care activities, which somehow imply an increased risk for falls.

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Most prescribed care for patients at risk of falls in hospital clinical practice showed consistency with the interventions recommended by the Ministry of Health and ANVISA to reduce the occurrence of falls in hospitals. This includes the implementation of measures that address risk assessment, multidisciplinary care, safe environment and promoting the education of patients and family[19].

CONCLUSION

The most prevalent nursing care prescribed for patients with ND Risk for falls were: keeping the bed rails, guiding patients/family regarding the risks and prevention of falls, keeping bell within reach of patients and keeping patients' belongings nearby, which were mapped in the interventions *Environmental Management: safety* and *Fall Prevention*.

These interventions for the ND Risk for falls included the largest number of prescriptions and diversity of care regarding guiding patients/family, mobilization/ambulation, environmental safety and monitoring of neurological disorders. Thus, these were really a priority for the ND Risk for falls because its activities include the multifactorial aspect of the event, which is corroborated by the NIC, literature and the national protocol for patient safety and clinical practice. These findings may assist in planning the prevention of falls in hospitals, contributing to a safer nursing care.

The process of cross-mapping between the prescribed care and the NIC interventions for the ND Risk for falls was arduous, since this classification has more than 500 interventions with more than 12,000 activities. Thus, in this process are admitted some limitations relating to the possibility of not having mapped the care of all available NIC interventions. However, the methodological accuracy used ensures that the data presented here include most of them, considering the specific scenario of care to patients with the ND Risk for falls.

The inclusion of the intervention *Neurological monitoring* is suggested among those recommended to solve/improve the ND Risk for falls in the chapter of links between the NIC and the NANDA-I. This is due to the fact of this intervention being the third most prevalent group of prescribed care, showing its importance in preventing falls in hospital settings. The intervention *Surveillance* could also be part of the links as optional additional because it involves activities of monitoring and risk detection.

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Correspondence addressed to: Amália de Fátima Lucena
Universidade Federal do Rio Grande do Sul,
Escola de Enfermagem
Rua São Manoel, 963 - Bairro Rio Branco
CEP 90620-110 - Porto Alegre, RS, Brazil
E-mail: afatimalucena@gmail.com