EFFECTIVENESS OF NANDA-I NURSING DIAGNOSIS 'RISK FOR FALLS' ON FALL INCIDENCE IN ELDERLY: A PROSPECTIVE COHORT STUDY

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Abstract

Aim

To assess the incidence of falls in community-dwelling older adults aged over 75 years according to the use of NANDA-I nursing diagnosis "Risk for Falls" by the patients' nurses.

Design

An analytical prospective cohort study involving 18 nurses and 250 patients from eight Primary Healthcare System Centers in the Community of Madrid, Spain.

Methods

A 16-month prospective cohort study was conducted in health centers in Madrid: one included 123 patients cared for by nurses who regularly used NANDA-I nursing diagnosis "Risk for Falls" and another cohort consisted of 127 patients whose nurses did not use it.

Results

The frequency of falls in patients over the age of 75 was 25.6%, with women accounting for 68.8% of all falls. Among patients cared for by nurses using NANDA-I nursing diagnosis "Risk for Falls", the incidence of falls was 18.7%, compared to 32.3% in those cared for by nurses who did not use it.

Conclusions

Patients cared for by nurses who routinely use "Risk for Falls", had 54% lower odds of falling (adjusted OR: 0.46) than patients cared for by nurses who do not use it. NANDA-I nursing diagnosis "Risk for Falls" along with associated nursing interventions, may support its inclusion in clinical guidelines and fall prevention protocols, encouraging its routine use by primary care nurses.

Introduction

European Union population is ageing, and this can be seen through different statistical indicators such as the evolution of the proportion of the elderly population, the dependency rate, and the average age. In Spain, the number of people aged 65 or older reached 9,459,010 in 2022. The Community of Madrid has an aging index in 2023 of 121.7 (ratio obtained by dividing the population aged over 65 by the population aged under 15, multiplied by 100). Falls are a major global public health problem, especially among the elderly. An estimated 684,000 accidental deaths globally every year are the second-leading cause of mortality caused by unintentional injury (World Health Organization, 2021).

According to the World Health Organization (2021), a fall is defined as an event which results in a person coming to rest inadvertently on the ground or floor or other lower level. Approximately one-third of people aged over 65 years living in the community can fall at least once a year (Lewis et al., 2020; Montero-Odasso et al., 2022). Falls represent a major health problem in elderly people and can lead to serious complications (physical and psychological health, and socioeconomic conditions), and even death. In several European countries (Landi et al., 2017), the importance of fall prevention for maintaining the health system is highlighted. Falls are widely recognized as multifactorial events influenced by the interaction of biological, behavioural, and environmental risk factors. The existence of more than 40 risk factors found in different reviews greatly limits formal meta-analysis to estimate the overall effect of studies analyzing risk factors or consequences of falls (Da Silva Gama et al., 2008a). Sarad et al. (2023) established risk factors for falls among the geriatric population into five groups: decreased mobility, chronic diseases, limits in activities of daily living (ADLs), medication use and sensory deficits. Although several risk factors have been identified and classified, their interpretation and associated consequences should be approached with caution, as most studies do not allow causal inferences due to the impossibility of clearly establishing cause-effect

relationships. (Da Silva Gama et al., 2008a). In a recent study, Domínguez-Fernández et al., identified 116,319 risk factors for NANDA-I nursing diagnosis "Risk for Falls" in the population older than 70 years recorded in the medical record of the primary health care system in Spain (AP_Madrid software) from 2005 to 2015, corresponding to a mean of 2.2 risk factors per diagnosis. The most recorded risk factors were Age ≥65 years (52.9%), Impaired mobility (39.2%), Impaired balance (27.2%), History of falls (21.8%), Use of assistive device (18.8%), Visual impairment (18.7%), Use of wheelchair (4.6%), Alteration in cognitive functioning (4.6%).

Falls among elderly people can lead to serious outcomes, such as fractures requiring hospital care and surgery, which place a financial burden on healthcare systems (Lewis et al., 2020). Falls range in severity from minor bruises to serious injuries with lasting health effects, and in extreme cases, death. They are also linked to reduced physical function, loss of independence, and fear of falling, which can decrease physical activity and social engagement (Frieson et al., 2018). Around 5–20% of falls result in severe injuries like fractures or head trauma, and some lead to long lie syndrome, which has serious health impacts (Rodríguez-Molinero et al., 2015). Fear of the consequences of fall-related injuries, often involving social deprivation, loss of independence and confidence, and admissions to long-term care facilities, can cause severe depression and anxiety (Da Silva Gama & Gómez Conesa, 2008b).

Nursing uses three major languages to describe nursing diagnoses, outcomes, and interventions, including NANDA International (NANDA-I), Nursing Outcomes Classification (NOC), and Nursing Interventions Classification (NIC). NANDA-I nursing diagnosis "Risk for Falls" (00303) (T. Heather Herdman et al., 2021) is defined as an adult susceptible to experiencing an event resulting in coming to rest inadvertently on the ground, floor, or other lower level, which may compromise health. The recording of the NANDA-I nursing diagnosis “Risk for Falls” by primary care nurses in the Community of Madrid increased steadily between 2005 and 2015,

rising from 650 diagnoses per year in 2005 to 14,695 in 2015. This increase was particularly pronounced from 2012 onwards, when the number of recorded diagnoses rose from 2,202 to 7,110, coinciding with the publication of a regional clinical practice guideline on fall prevention that included a standardized care plan for this diagnosis (Domínguez-Fernández et al., 2023).

The record of NANDA-I nursing diagnosis "Risk for Falls" in the Community of Madrid Primary Healthcare System (PHS), called AP_Madrid, uses Gordon's functional health patterns along with NANDA, NIC, and NOC to document nursing care. AP_Madrid allows access from any PHS to the EHR (Electronic Health Record) of over six million residents, enabling centralized data use. Electronic records facilitate the documentation of all care activities, improve patient safety and continuity of care, and assist in clinical decision-making.

Aims

The primary objective of the study is to assess the incidence of falls in community-dwelling older people aged over 75 years according to the use of the NANDA-I nursing diagnosis 'Risk for Falls' by the patients' nurses.

The secondary objective is to identify the risk factors that most influence the incidence of falls.

Methods

Design

An analytical prospective cohort study was carried out from December 2016 to April 2018 (16 months).

Setting and participants

Multicenter study conducted in eight PHS centers in the Community of Madrid, Spain. Figure 1 presents a flow chart summarizing the selection criteria for nurses and patients, as well as the incidence of falls and the multivariate analysis.

Selection criteria nurses

Nurses working in Madrid's health centers are responsible for providing care in the community: promoting healthy lifestyles, vaccinations, monitoring chronic patients, elderly care, home care, etc. Each nurse is responsible for a population of between 1,500 and 2,000 people, and no overlap of patients occurred between nurses..

Nurses' participation in the study required their consent and a commitment to remain at the same center during the study period without any plans to move to another center. The exclusion criteria were nurses on sick leave or scheduled surgery with a slow recovery.

Two groups were created: the NANDA GROUP and the NON-NANDA GROUP. Each group contained nine nurses, for a total of 18 nurses. Nurses from the NANDA GROUP were nurses who used NANDA-I nursing diagnosis "Risk for Falls" regularly, ≥40 "Risk for Falls" registered in patients over 75 years in the 6 months before the study. Nurses from the NON-NANDA GROUP were nurses who don´t use NANDA-I nursing diagnosis "Risk for Falls" regularly, ≤5 "Risk for Falls" registered in patients over 75 years in the 6 months before the study. These nurses were from the same PHS or, otherwise, from the same basic area as the NANDA GROUP. Previously, we made a descriptive study performing a retrospective review of EHR data (2005-2015) to identify these nurses and divide them into two groups according to the criteria described (Domínguez-Fernández et al., 2023).

Nurses participating in the study received initial training to ensure consistent data collection, clarify any doubts, and minimize potential biases. The study was double-blind; nurses were unaware that they themselves were being evaluated, as they believed the evaluation focused solely on the patients. We consider this an important methodological aspect that likely reduced bias.

Selection criteria patients

The selected patients were over 75 years of age. This age was chosen based on the results of a previous study which found that the majority of NANDA-I nursing diagnosis "Risk for Falls"

were made in patients over this age (Domínguez-Fernández et al., 2023). Patients should have been assigned a nurse who meets criteria inclusion, and patients signed a consent to participate in the study. The exclusion criteria were patients in palliative care or a life prognosis less than 6 months, institutionalized patients, patients with programmed admission for a long-term stay (> 1 month) during the study period and patients with frequent changes of normal residency.

Sampling size

The sample size was initially calculated based on estimating the prevalence of falls in this population, assumed to be 30% according to the literature, with 80% power ($Z\beta = 0.80$) and 95% confidence ($Z\alpha = 0.95$), and a margin of error of 10%. This resulted in a required sample of 69 patients per group. To account for possible losses such as deaths or transfers, the sample size was increased by approximately 20%, aiming at 83 patients per group. Ultimately, the study included 250 patients (127 in the NANDA GROUP and 123 in the NON-NANDA GROUP), which exceeds the initially calculated number.

Ethical Considerations

The study was approved by the Central Research Commission of the Primary Care System (51/16) and by the Ethical Committee of Clinical Research of Madrid (Minute 309/16). The study was conducted in accordance with the Declaration of Helsinki (2013 revision). Informed consent was obtained from all participants prior to inclusion. All data were handled with strict confidentiality, and patient information was anonymized using identification codes to ensure privacy.

Data collection, exploitation and processing methods

Data collection

A data collection notebook was designed with basic nurse information (nurse´s gender and age, health center) and different patient data:

- Sociodemographic data: patient's gender and age, identification of the nursing professional, educational level, cohabitation.
- Risk factors assessment: personal history of some diseases (Diabetes, Arterial hypertension, Parkinson's disease, Heart failure, Dementia, Chronic obstructive pulmonary disease, Cerebrovascular disease, Peripheral arterial disease), history of falling in the last year, self-perceived health status (very good, good, fair, poor), drug consumption (Antidepressants, Sedatives, Diuretics, Oral antidiabetics/insulin, Vasodilators/Angiotensin-converting enzyme inhibitors), Charlson comorbidity index, Mini Nutritional Assessment screening (MNA), Urge Urinary Incontinence, impairment walking, Falls Efficacy Scale International (FES-I), ADLs, Lawton instrumental activities of daily living scale (IADLs), Tinetti scale for balance and gait assessment, Downton fall risk index, alteration in cognitive functioning (Pfeiffer Short Portable Mental Status Questionnaire, SPMSQ), ultra-short version of the Geriatric Depression Scale of Yesavage, Gijon social-family scale.
- The variable of exposure was the use of NANDA-I nursing diagnosis "Risk for Falls", data analyzed in a previous study (Domínguez-Fernández et al., 2023)
- Fallen event assessment (dependent variable): every month, assessing the place, direction, circumstances, causes of falls, consequences/injuries, and need for healthcare.

The data on professional and sociodemographic data, patient history and risk factor assessment were completed at the beginning of the study (face-to-face interview).

Data on fallen event assessments were collected monthly by phoning or attending a scheduled appointment. The follow-up was period was determined by a review (Ganz et al., 2005) that recommended that the maximum recommended follow-up interval in cohort studies of falls is one month, because of possible reporting bias due to cognitive impairment and memory problems in older people.

Data processing

The information from the data collection notebooks was entered into a database designed and created using Microsoft Office Excel-2010.

Each nurse sent the data collection notebooks to the head of the research team on a six-monthly basis.

All nurses were followed up individually by calling, emailing or meeting as required to address any concerns.

This database also contained data on the use of NANDA-I nursing diagnosis "Risk for Falls", extracted from clinical history using SQL (Structured Query Language) statements.

Data analysis

A general description of the main variables of the study is given. Quantitative variables are presented as mean-and standard deviation, and qualitative variables are presented as absolute frequency distributions and percentages.

Comparisons between variables and between the NANDA GROUP and NON-NANDA GROUP-were made using the chi-squared test for qualitative variables and Student's t-test or ANOVA for quantitative variables, depending on whether they were dichotomous or polychotomous, after checking the normal distribution of the variables using the Kolmogorov-Smirnov test.

For the evaluation of the dependent outcome variable ('falling event') the incidences in both groups have been calculated, establishing the odds ratio (OR) of having falls according to the use of NANDA-I nursing diagnosis "Risk for Falls". For the comparison between variables and incidence of falls, chi-square is used for qualitative and logistic regression for qualitative ordinal.

A multivariate analysis was conducted to identify independent factors associated with the risk of falls. After bivariate analysis, variables with significant associations were included in a

forward-step logistic regression model using Wald's method. For each variable retained in the final model, the odds ratio (OR), 95% confidence interval (CI), and p-value are presented, reflecting their independent contribution to predicting falls. The regression coefficient (B) was omitted to facilitate clinical interpretation. Given the binary nature of the outcome and the moderate incidence of falls, multivariate logistic regression was used as a robust and widely accepted method for estimating associations, consistent with standard epidemiologic practice (McNutt et al., 2003).

Data collection is complete for most variables, and the sample size obtained for variables with missing data preserves the statistical power of the study.

During the follow-up period, 11 patients (4.4%) were lost, of whom 6 died, 4 were transferred to nursing homes and 1 was transferred to another area. No special treatment was applied to the data as the initial sample of 250 patients was higher than the calculated sample size of 180 patients (which included a 20% attrition rate).

Results

The mean age of the 9 nurses in the NANDA GROUP was 50.9 (±9.9) years, whereas the mean age of the 9 nurses in the NON-NANDA GROUP was 49 (±12.3) years ($p>0.05$).

The 2 study groups (NANDA GROUP and NON-NANDA GROUP) were homogeneous with respect to baseline sociodemographic and clinical characteristics (Table 1). The follow-up time was 16 months. There were no significant differences in the age of elderly population ($p>0.05$). Small differences were observed between both groups, without major clinical relevance. Significant differences between groups were observed for marital status, use of vasodilators, and fear of falling.-In the case of the variable fear of falling, we can see in the table that those who belong to the NANDA GROUP have a greater fear of falling.

Frequency of falls in patients over the age of 75 were 25.6%, being much more frequent in women (68.8% of total falls). 70.3% of patients who fell suffered a single fall, while 29.7% fell two or more times.

The incidence of falls among patients cared for by nurses who used the NANDA-I nursing diagnosis “Risk for Falls” was 18.7%, compared to 32.3% among those whose nurses did not use the diagnosis. Patients in the latter group had significantly higher odds of experiencing a fall, with an OR of 2.1.

In addition to the use of NANDA, the patient's clinical situation was also identified as an influence on the incidence of falls: history of falling, drug use (antidepressants and sedatives), urge urinary incontinence, presence of comorbidity, low capacity for ADLs, fear of falling, risk of malnutrition, disturbances in balance and gait, and high risk of falls on the Downton fall risk index (Table 2). In multivariate analysis, factors associated with the incidence of falls were the use of the NANDA-I nursing diagnosis "Risk for Falls", a history of falling in the last year, and urge urinary incontinence (Table 2).

There were losses of 11 patients (4.4%), of whom 6 died, 4 were transferred to care homes and 1 was displaced.

Discussion

The use of the NANDA-I nursing diagnosis “Risk for Falls” was associated with a lower likelihood of falling. In bivariate analysis, the absolute difference in fall incidence between groups was 13.6%. In multivariate analysis, individuals cared for by nurses who systematically use the NANDA diagnosis were 54% less likely to experience a fall (OR = 0.46) compared to those whose nurses did not use it systematically. Although the study was conducted prior to the 2024–2026 NANDA-I edition, in which the diagnosis “Risk for Falls” was renamed and subdivided into Risk for Adult Falls and Risk for Child Falls, the original diagnosis was the one in force during the study period and encompassed the adult population included in this analysis.

Therefore, our findings remain applicable to the current adult-focused diagnosis and support the relevance of structured nursing diagnostic reasoning in fall prevention. The effectiveness of this intervention hasn´t been previously evaluated, and we consider it essential to carry out effective fall prevention in PHS.

The other factors we identified in our study as influencing the incidence of falls are discussed below.

Factors identified in this study that influence incidence of falls

Elderly people with a history of falls in the past year were 2.33 times more likely to have fallen than those without a history of falls. Domínguez Fernández et al (2023) evaluating ND and risk factors identified by nurses, previous falls are one of the most common risk factors (23.6%). Recurrent falls and the high rate of multiple falls are one of the most important elements in assessing fall risk (Demura et al., 2012). In addition, several studies have identified previous falls as a risk factor for recurrent falls (Salvà et al., 2004; Da Silva Gama et al., 2008a). Consistent with these findings, a recent study by Fhon et al. (2024) provided clinical validation of the nursing diagnosis "Fall risk in adults (00303)" in a community-dwelling elderly population. The authors identified significant risk factors such as difficulty performing instrumental activities of daily living, cognitive dysfunction, and anxiety, which were associated with higher fall incidence. This study reinforces the relevance of assessing multiple risk factors within the NANDA-I diagnostic framework and highlights the applicability of nursing diagnoses in fall prevention strategies.

The presence of previous falls is also part of the screening to identify adults at risk for falls in the RNAO-BPG-Prevention of Falls and Reducing Injury from Falls Best Practice Guideline (Registered Nurses' Association of Ontario, 2017).

Sedatives and antidepressants (Gama & Gómez-Conesa, 2008) are two of the groups of drugs most associated with fall risk in the literature and in our study. Montero-Odasso et al (2022)

shows the recommendation to assess for fall history and the risk of falls before prescribing potential fall risk increasing drugs to older adults.

We found significant differences in nutritional status according to the MNA. The European Society for Clinical Nutrition and Metabolism recommends the use of the MNA tool because it can better and earlier detect risk or malnutrition in frail older people and because it includes a dietary questionnaire in addition to relevant physical and social aspects (Zugasti Murillo & Casas Herrero, 2019). To facilitate its use, the abbreviated form of the questionnaire (the one used in our study) was developed and showed a strong correlation with the total MNA (r = 0.945). Even a study identified nutritional status as one of only two factors associated with fall incidence (Lavedán Santamaría A, 2013). In our study, individuals at risk of malnutrition had 2.52 times higher odds of falling compared to those not at risk. There are also significant differences in both bivariate and multivariate analyses regarding urge urinary incontinence in our study. People with urge urinary incontinence had 3.48 times higher odds of falling compared to those without. According to urinary incontinence type, a significant association between urinary incontinence and falls was observed specifically in patients with urge urinary incontinence (OR, 1.76; 95% CI, 1.15–1.70) (Moon et al., 2021).

Several studies have identified urinary incontinence as a risk factor for falls (Da Silva Gama & Gómez Conesa, 2008b; Foley et al., 2012; Da Silva Gama et al., 2008a). It is important to note that urinary incontinence has also been independently linked to falling and fear of falling in older people (Olmos Zapata P, 2012). Moreover, a recent systematic review and meta-analysis is highlighted that urgency urinary incontinence, a specific subtype characterized by a sudden and intense urge to urinate, is particularly associated with a higher risk of falls and fractures in older adults (Lu, Shi, Zhang, Wang, & Zhu, 2021).

According to the Barthel Index, the degree of dependence is related to the history of recent falls, the need for walking aids and the type of walking (Betancur Pulgarín et al., 2019) In our study,

moderately dependent patients had 2.83 times higher odds of falling compared to independent patients. It is possible that moderately dependent people are more resistant to their new situation of dependence and therefore try to meet their needs autonomously, which increases the risk of falling (Anaya Moya & Ariza Naupay, 2018). There are similarities to other studies (Brito et al., 2013; Manrique-Espinoza B et al., 2011).

In terms of gait and balance problems, patients with lower scores on the Tinetti scale had 2.58 times higher odds of falling compared to patients with higher scores. In one study, the combined effect of four assessment tests, two of which are the Barthel Index and the Tinetti Scale, led to a greater ability to predict the risk of falls in older users than the use of a single scale (Aceituno Gómez, 2008). One of the most used scales to assess mobility and fall risk is the Timed Up & Go, which correlates well with the Tinetti scale, although the Tinetti scale takes longer to complete (Roqueta et al., 2007). Therefore, the predictive ability of fall risk described in previous literature could be confirmed.

In our study, patients without comorbidity had 2.64 times higher odds of falling compared to those with low comorbidity when analyzing the Charlson index. This may be explained by factors such as possible overconfidence in their physical abilities, lower awareness of fall risk, and less frequent implementation of preventive measures. Some studies have found no significant association between the number of illnesses and falls (Brito et al., 2013).

Fear of falling is very important to determine. We found significant differences between people with low and high fear of falling. Patients with a high fear of falling had 2.95 times higher odds of falling compared to those with low fear. Fear of falling is reported by between 30 and 73% of older people who have fallen. (Rubenstein & Josephson, 2005).The FES-I is the most widely used tool internationally for comprehensive assessment of post-fall syndrome and its subsequent modifications have excellent reliability, correlate with measures of balance and weight, and are predictive of future falls and decline in functional ability (Yardley et al., 2005).

Montero-Odasso et al (2022) recommend using a standardized instrument to evaluate concerns about falling such as the FES-I or Short FES-I in community-dwelling older adults. In addition, the FES-I scale can be used to predict future falls and a decline in the functional ability of the individual (Cumming et al., 2000).

Fall-prevention strategies

The prevention of falls in the community is a major public health challenge in the current context of an ageing population, and it is therefore essential to develop strategies to reduce the risk of falls.

Tricco et al (2017) assesses the potential effectiveness of fall prevention interventions. The results showed that exercise (OR, 0.51), combined exercise, vision assessment and treatment, and environmental assessment and modification (OR, 0.30), combined exercise, and vision assessment and treatment (OR, 0.17), and combined clinic-level quality-improvement strategies, multifactorial assessment and treatment, calcium supplementation, and vitamin D supplementation (OR, 0.12) were significantly associated with reductions in injurious falls. Montero-Odasso et al (2022) create a set of evidence- and expert consensus-based falls prevention and management recommendations applicable to older adults based primarily on exercise programmes.

Goodwin et al (2014) observed that multidimensional interventions have greater effectiveness. In this approach, it could work with all the professionals from PHS considering risk factors and high impact intervention strategies.

Considering the results of our study and the multifactorial origin of falls described in the literature, we believe it is essential to incorporate the use of the NANDA-I nursing diagnosis "Risk for Falls" in the prevention of falls. This should be used in combination with other evidence-based strategies such as urge urinary incontinence, falls in the last year and physical activity.

The main limitation of the study was variability in nurses' assessment of patients' clinical status due to the large number of nurses involved, despite a training session held before data collection to explain the variables.

On the other hand, using the EHR as a source of information to obtain data related to the use of the care process does not allow us to ensure the quality of the records, as they are designed for care purposes and not for research. In any case, we believe that the use of a standardized language, such as the NANDA-I, NOC, NIC taxonomies, within the Care plan registration module (in AP_Madrid), contributes to the improvement of the quality of the recording of the information. In addition, the validity of the information is ensured by the fact that most of the data were obtained from a data collection notebook specifically designed for the study.

Contributes to nursing practice, research, policy, and/or education

This study highlights the essential role of the nursing process, with nursing diagnoses as an important step in comprehensive care. Findings related to the use of the NANDA-I diagnosis "Risk for Falls" indicate a favourable impact on fall incidence in Primary Care nursing. The consistent use of the "Risk for Falls" NANDA nursing diagnosis supports its consideration for inclusion in clinical practice guidelines and Electronic Health Record systems as a standard tool for fall risk assessment in Primary Care. Furthermore, results emphasize the need for incorporating theoretical and practical nursing process training early in nursing education programs to strengthen care delivery and professional practice.

Conclusions

Patients whose nurses routinely used the NANDA-I nursing diagnosis "Risk for Falls" had 54% lower odds of experiencing a fall (adjusted OR: 0.46) compared to those whose nurses did not use it. According to multivariate analysis, the factors independently associated with fall incidence were the use of this nursing diagnosis, a history of falls in the previous year, and urge

urinary incontinence. These findings suggest that standardized nursing assessments may contribute to fall prevention among older adults living in the community.

Nurses should routinely assess key risk factors—such as prior falls and urge urinary incontinence—to inform targeted preventive strategies. Encouraging the standardized use of nursing diagnoses may improve care quality and patient safety. Future research should identify the most effective interventions linked to this diagnosis and examine barriers to its wider adoption.

List of abbreviations

ADLs: activities of daily living

ANA: American Nurses Association

EHR: Electronic Health Record

FES-I: Falls Efficacy Scale-International

IADLs: Activities of Daily Living Scale

NANDA GROUP: nurses used NANDA nursing diagnosis "Risk for Falls" regularly

NON-NANDA GROUP: nurses who don´t use NANDA nursing diagnosis "Risk for Falls" regularly

MNA: Mini Nutritional Assessment

NANDA-I: Nanda-International

NOC: Nursing Outcomes Classification

NIC: Nursing Interventions Classification

OR: Odds Ratio

PHS: Primary Healthcare System

SQL: Structured Query Language

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Table 1. Sociodemographic and clinical variables according to use of NANDA nursing diagnosis “Risk for Falls”.

Variables	NON-NANDA GROUP N=127*	NANDA GROUP N=123*	p
Sociodemographic variables			
Age patients	83.03(4.59)	82.99 (4.10)	p>0.05
Sex patients	-	-	p<0.01
Women	72 (56.7%)	89 (72.4%)	
Men	55 (43.3%)	34 (27.6%)	
Educational level of the population	-	-	p>0.05
Literacy needs	6 (4.7%)	2(1.6%)	
Can read and write	55 (43.3%)	41(33.3%)	
Primary education	43 (33.9%)	47(38.2%)	
Secondary education/ Baccalaureate	16 (12.6%)	18(14.6%)	
Higher education	7 (5.5%)	15(12.2%)	
Cohabitation	-	-	p<0.01
Alone	28 (22%)	42 (34.4%)	
Partner	70 (55.1%)	39 (32%)	
Partner and family	11 (8.7%)	11 (9%)	
Carer	1 (0.8%)	8 (6.6%)	
Other family member	17 (13.4%)	22 (18%)	
Death of a partner in the last year	-	-	p>0.05
Yes	1 (0.8%)	1 (0.8%)	
No	126 (99.2%)	121 (99.2%)	
Clinical variables			
Previous chronic pathology	-	-	p>0.05
Diabetes	42 (33.1%)	40 (32.5%)	
Arterial hypertension	104 (81.9%)	102 (82.9%)	
Parkinson's disease	5 (3.9%)	3 (2.4%)	
Heart failure	49 (38.6%)	35 (28.5%)	
Dementia	6 (4.7%)	6 (4.9%)	
Chronic obstructive pulmonary disease	11 (8.7%)	12 (9.8%)	
Cerebrovascular disease	16 (12.6%)	17 (13.8%)	
Peripheral arterial disease	10 (7.9%)	6 (4.9%)	

Falling in the last year	-	-	p>0.05
Yes	48 (37.8%)	43 (35%)	
No	79 (62.2%)	80 (65%)	
Self-perceived health status	-	-	p>0.05
Very Good	6 (4.9%)	10 (9.9%)	
Good	53 (43.1%)	48 (47.5%)	
Fair	59 (48%)	37 (36.6%)	
Poor	5 (4.1%)	6 (5.9%)	
Drug consumption	-	-	p>0.05
Antidepressants	22 (18.3%)	20 (20.6%)	
Sedatives	36 (30%)	23 (23.7%)	
Diuretics	64 (53.3%)	60 (61.9%)	
Oral antidiabetics/insulin	34 (28.3%)	25 (25.8%)	
Charlson Comorbidity	-	-	p>0.05
No comorbidity	69 (54.3%)	82 (66.7%)	
Low comorbidity	38 (29.9%)	27 (22%)	
High comorbidity	20 (15.7%)	14 (11.4%)	
Barthel Index	-	-	p>0.05
Total dependence	0	0	
Severe dependence	6 (4.7%)	4 (3.3%)	
Moderate dependency	34 (26.8%)	32 (26.2%)	
Low dependency	29 (22.8%)	20 (16.4%)	
Independence	58 (45.7%)	66 (54.1%)	
Lawton instrumental activities	-	-	p>0.05
Total dependence	9 (7.1%)	3 (2.4%)	
Severe dependence	8 (6.3%)	11 (8.9%)	
Moderate dependency	23 (18.1%)	15 (12.2%)	
Low dependency	28 (22%)	33 (26.8%)	
Independence	59 (46.5%)	61 (49.6%)	
Mini Nutritional Assessment screening	-	-	p>0.05
Malnutrition	1 (0.8%)	3 (2.5%)	
Risk of malnutrition	26 (20.5%)	27 (22.3%)	
Normal	100 (78.7%)	91 (75.2%)	
Tinetti scale	-	-	p>0.05
High risk of falls	39 (30.7%)	38 (30.9%)	

Risk of falls	37 (29.1%)	39 (31.7%)	
Low risk of falls	51 (40.2%)	46 (37.4%)	
Downton fall risk index	-	-	p>0.05
Low risk of falls	59 (46.5%)	50 (40.7%)	
High risk of falls (>2)	68 (53.5%)	73 (59.3%)	
Pfeiffer Short Portable Mental Status Questionnaire	-	-	p>0.05
Normal	114 (89.8%)	108 (87.8%)	
Mild impairment	8 (6.3%)	8 (6.5%)	
Moderate impairment	4 (3.1%)	6 (4.9%)	
Significant impairment	1 (0.8%)	1 (0.8%)	
Depression Scale of Yesavage	-	-	p>0.05
Low risk of depression	100 (78.7%)	86 (69.9%)	
Depression (≥2)	27 (21.3%)	37 (30.1%)	
Falls Efficacy Scale International	-	-	p<0.01
Low	45 (37.2%)	17 (14.9%)	
Moderate	27 (22.3%)	32 (28.1%)	
High	49 (40.5%)	65 (57%)	
Gijon social-family scale.	-	-	p>0.05
Good social situation	65 (52%)	74 (60.7%)	
Social risk	50 (40%)	42 (34.4%)	
High social risk	10 (8%)	6 (4.9%)	
Urge Urinary Incontinence			p>0.05
Yes	47 (38.2%)	43 (42.6%)	
No	76 (61.8%)	58 (57.4%)	
Gait impairment			p>0.05
Yes	51 (41.8%)	42 (42%)	
No	71 (58.2%)	58 (58%)	

*Participants did not provide information for some variables.
NANDA GROUP: ≥40 “Risk for Falls” NANDA nursing diagnosis registered in patients over 75 years in the 6 months before the study.
NANDA NON-GROUP: ≤5 “Risk for Falls” NANDA nursing diagnosis registered in patients over 75 years in the 6 months before the study.

Tabla 2. Bivariate and Multivariate Analysis of Factors Associated with Falls

Variable	OR (Bivariate)	95% CI (Biv)	p-value (Biv)	OR (Multiv)	95% CI (Multiv)	p-value (Multiv)
Use NANDA nursing diagnosis "Risk for Falls"	0.48	0.268–0.867	0.014	0.46	0.23–0.93	0.031
Falling in the last year	3.35	1.860–6.034	< 0.001	2.33	1.18–4.60	0.015
Antidepressants	2.62	1.299–5.266	0.006			
Sedatives	2.24	1.186–4.239	0.012			
Urgency Urinary Incontinence	3.69	2.000–6.811	< 0.001	3.48	1.58–7.68	0.002
Charlson (absence vs. low)	0.38	0.173–0.830	0.015			
MNA (normal vs. risk)	2.52	1.321–4.798	0.005			
Barthel (independent vs. moderate dependency)	2.83	1.435–5.569	0.003			
Tinetti scale (high vs. low)	2.58	1.263–5.273	0.009			
FES-I (low vs. high)	2.94	1.314–6.598	0.009			

Only variables retained in the final multivariate model are shown in the multivariate columns. OR: Odds Ratio; CI: Confidence Interval.