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Comparison of the Morse Fall Scale and STRATIFY scale on the risk of falls among the elderly

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Abstract

The use of risk assessment instruments with an emphasis on preventing an event and reducing damage has provided support for the management of falls. The aim of the study was to perform a comparative analysis between the scales that predict falls among the elderly Morse Fall Scale (MFS) and St. Thomas Risk Assessment Tool in the Falling Elderly Inpatients (STRATIFY), in a unit of a philanthropic hospital, Campo Grande, MS, Brazil. A quantitative cross-sectional study was carried out from February to September 2018, by nurse residents in the Multiprofessional Health Residency Program, Campo Grande, MS. The STRATIFY and Morse Fall Scale instruments were used. The data were treated statistically by the Kolmogorov-Smirnov, Mann-Whitney U and Kruskal-wallis tests. 31 elderly people participated in the study. The results were heterogeneous in the comparison between the instruments, the MFS demonstrates that as the patient obtains mobility, the risk for falls increases; while STRATIFY, when investigating risk factors directed to the elderly, identified high levels of high risk for falls in the three assessment moments. It is concluded that the STRATIFY instrument was significantly associated with the risk of falling and had a better discrimination in predicting falls in hospitalized elderly than MFS.

Keywords: Gerontology. Risk factors. Accidents due to falls. Aging. Elderly health.

INTRODUCTION

The number of adults over 60 will reach 2 billion by 2050 and will constitute more than 20% of the world population[1]. Human aging is marked by multidimensional changes that directly influence the independence and autonomy of the elderly. Among the geriatric syndromes, the 'fall' stands out as a worrisome and disabling event, due to its repercussions in the economic, social and health spheres[2-3].

A fall can be defined as an "unintentional contact with the support surface, resulting from the individual's position changing to a level lower than their initial position,

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without an intrinsic determining factor or an inevitable accident" [4:72].

In order to reduce unsafe care acts in Brazil, the National Patient Safety Program was established aiming at the quality of the services offered, and the prevention of falls during hospitalization is one of its strategies. The establishment of protocols and preventive measures aims to reduce this event, which reaches the mark of 3 to 5 per 1,000 hospitalized patients/day.

Falls associated with elderly people represent one of the biggest public health problems in the world and are related to high morbidity and mortality, mainly associated with restricted mobility, fractures, depression, functional disability, loss of independence and autonomy, institutionalization and decline in quality of life in aging, causing an overload to health systems with consequent hospitalization[5].

In the hospital environment, falls associated with the elderly are the most commonly encountered adverse events, the most frequent consequences of which are: physical, psychological and social damage, in view of the need to reorganize the network of caregivers to support the elderly victim of a fall. The main complications associated with falls in this scenario are the increase in the length of hospital stay and the cost of treatment, as well as the relative worsening of the clinical condition in view of the need for new approaches to treat the condition[6].

The use of risk assessment instruments with an emphasis on preventing the event and reducing damage has provided support for the management of falls[7]. And they are especially composed of a representative set of risk factors, favoring the risk level for the occurrence of falls. Such tools must guarantee reliability, transparency and simplicity in their application and handling. Strategic situations for reducing the incidence of falls include surveillance and intervention of risk factors, where risk assessments can provide information for prevention and intervention[8-9].

Among several devices for predicting falls, five instruments have been more widely used, namely: the Innes Score (1985), the Morse Fall Scale (MFS; 1989), the Schmid Score (1990), the Downton index (1996) and the St. Thomas Risk Assessment Tool in the Falling Elderly (STRATIFY; 1997). Of these, only two were tested in different groups of patients, outside of the original investigative study; the Morse Fall Scale (MFS) and the risk assessment STRATIFY[8,10].

The STRATIFY instrument, built in 1997 in England, predicts the risk factors that can be clearly assessed by nurses as part of the routine assessment instrument. It was developed to be used in hospitalized elderly people with health problems resulting from a stroke with a great need for rehabilitation, received cross-cultural adaptation and validation into Portuguese in 2019[10-11].

In 1989, Janice Morse published the MFS, which consists of a specific instrument to assess the risk of falls, using six assessment criteria. It was translated and adapted into Portuguese in 2013 by Brazilian researchers, built to be applied through interviews with patients and consultation of clinical processes[12-13].

Both instruments can be used by nurses, in an attempt to implement measurements to prevent this event. Consequently, health care services must have available resources that allow correct diagnoses of the situation of each elderly person to be made, to subsequently plan the most appropriate interventions[3].

The literature points out that MFS is one of the most prevalent tools used to assess a patient's risk of falling14. However, there are particularities in the hospitalized

elderly that this scale does not predict, and that other screening tools can predict falls according to the profile of this population, such as the STRATIFY scale recommended by the Ministry of Health, already validated for Brazil and used in hospitalized elderly.

It is believed that in the coming years the hospitalization of elderly people will increase, and Brazilian hospitals need to guarantee quality of care and especially patient safety, in preventing falls. For this reason, identifying the scale with the highest risk prediction and that best fits the profile of this population is necessary in order to minimize the costs that this event may entail and reduce the length of stay of the hospitalized elderly.

After an integrative review of the literature on these two scales, most used in the Brazilian reality, there was a scarcity of comparative studies on the instruments. In view of this finding, the question proposed was, "Which of the two scales could more accurately predict the fall of the hospitalized elderly person, taking into account the specific risk factors in the elderly and the profile of this population?"

This study is justified due to the identification of gaps that need to be filled in this theme, where, after systematic searches in the literature, we find that falling is an urgent problem for public health, and that the instruments that predict falls need to be sensitive to risk factors of the elderly person. For this reason, the state of the art of this study is related to the importance of the MFS and STRATIFY instruments in the prediction of falls, and their comparison has social relevance, as it will assist the professional nurse to act to prevent a falling event of the elderly patient.

Therefore, the objective of the study was to perform a comparative analysis between the Morse Fall Scale and STRATIFY fall prediction scales among elderly, in a unit of a philanthropic hospital, Campo Grande, Mato Grosso do Sul, Brazil.

METHODOLOGY

This was a quantitative cross-sectional study, carried out at the Integrated Continuous Care (ICC) unit of a philanthropic hospital in Campo Grande, Mato Grosso do Sul, Brazil.

At the ICC unit, the Multiprofessional Health Residency Program of the Federal University of Mato Grosso do Sul is developed, in partnership with the philanthropic hospital, which currently integrates the Health Care Network of the Unified Health System to continue the care and rehabilitation of patients with chronic diseases, mostly elderly, after their hospitalization in tertiary and quaternary hospitals, in the acute phase of their disease. Thus, the hospital already develops this activity of continuity of care, through multiprofessional teams and a support network, seeking involvement of the family and or caregivers.

This unit corresponds to a network of continuous health care and social support that provides services to people in situations of dependence, with the objective of recovering or maintaining their autonomy and maximizing their quality of life. The flow of care occurs

by signaling patients with the profiles for rehabilitation care, referred from the main high complexity hospitals. After admission, the estimated length of stay is a minimum of 15 days and a maximum of 60 days.

Data collection took place between February and September 2018, by nurse residents in the Multiprofessional Residency Program in health directed at the health of the elderly. The sample was a simple random probabilistic study with people aged 60 years or over. Included in the study were people hospitalized in the unit with a minimum stay of seven days and those who agreed to participate in the study. Those who requested discharge due to evasion or died during hospitalization were excluded. The final sample was 31 elderly people, as shown in figure 1.

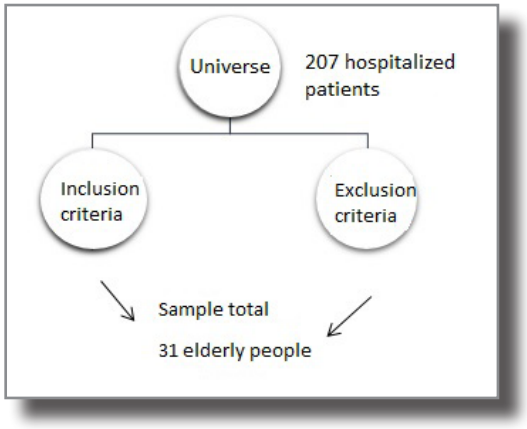

Figure 1. Flowchart of the sample composition of the present study, Campo Grande, MS, Brazil, 2020.

To collect sociodemographic and health information, a form developed by the authors was used in order to obtain the dependent and independent variables by consulting the individual medical records.

The independent variables of the study were divided into sociodemographic variables: age, sex, marital status, place of birth, municipality of residence, neighborhood, color, education, type of residence, number of people with whom they live, who do they live with, monthly family income, occupation, profession; and health variables: diagnostic hypothesis, pre-existing diseases, International Disease Code (IDC-10), drugs in use, number of drugs in use. The variables dependent on the occurrence of falls were established from the items of the STRATIFY and MFS scales.

The two instruments for predicting falls, the MFS and STRATIFY, were applied, both were used in three moments of hospitalization: the first assessment was upon admission, the second after 15 days of stay and the last on the day of discharge from the patient, in order to demonstrate the possible modifications of the scores and determine the main reasons for the occurrence of falls.

The risk assessment scales assign numerical values to each item investigated, where the sum of these predicts whether the individual is at risk for falls, according to their stratification score. Both instruments were validated into Portuguese; MFS in 2013 and STRATIFY in 2019.

The MFS consists of six assessment items, which are: 1) history of falls, where it investigates the occurrence of falls during the period of hospitalization or if they have a recent history (up to three months) of falls before hospital admission; 2) secondary diagnosis, which occurs when the patient has more than one medical diagnosis in the medical record; 3) assistance in walking, which investigates the need or not of equipment to assist in walking, aided by a member of the team or moves around by supporting furniture/wall; 4) intravenous therapy/saline or heparinized intravenous device, the use of these devices is observed; 5) gait, which determines characteristic of their gait, if normal, bedridden or using a wheelchair, as well as being considered as weak, impaired or staggering; and 6) mental state, where the patient's orientation regarding their capacity/limitation or the

fact that they overestimate their capacity and forget limitations is determined[12].

The MFS score can vary between 0 and 125 points, the patient classified between 0 and 24 points has a low risk of falling during hospitalization; those who score between 25 and 44 points have moderate risk; and patients with 45 points or more have a high risk of falling. With the MFS scale, it was possible to assess the occurrence of falls in the previous 3 months. This data was investigated with the notifications made at the unit to determine the number of falls in the research period[12].

Through STRATIFY it is possible to evaluate five items that the scale proposes, they are: 1) Patient hospitalized because of a fall or with a fall episode during hospitalization; 2) Patient is agitated; 3) Patient with visual changes that affect their daily activity; 4) Patient needing to use the bathroom frequently; 5) The patient has a transfer or mobility score of 3 or 4 (their scores are already proposed on the instrument itself). In order to stratify the risk assessment for falls by means of scores, a final score of 0 indicates low risk, 1 moderate risk and 2 or more high risk for this event[15].

The organization and analysis of the data were processed using the Statistical Package for the Social Sciences®, version 20.0. Then, these data were treated statistically by parametric and non-parametric tests, such as simple frequency distribution and dispersion measures. The data are presented in descriptive format, by means of proportionality measures for categorical variables [% (n)]. Continuous numerical variables are expressed as mean, standard deviation and 95% confidence interval [mean ± SD (CI95%)]. The Kolmogorov-Smirnov test was applied to verify the normality of the distribution. After non-verification of normality (non-parametric data), a Mann-Whitney U test for independent groups was applied to compare sexes, age groups, monthly income and type of housing. The Kruskal-wallis test was also applied to compare marital status and ethnicity. In all cases, a significance level of 5% was considered.

The study was approved by the Research Ethics Committee of the Federal University of Mato Grosso do Sul on December 14, 2017 under the CAAE number: 79996817.0.0000.0021; it was conducted according to the required ethical standards. The Informed Consent Form (ICF) was appli ed.

RESULTS

Table 1 describes the sociodemographic profile of elderly people hospitalized in the period from February to September 2018 in the investigated unit.

The health characteristics comprised by pre-existing diseases and the diagnosis of disease identified during hospitalization, were such that 25.8% (n=8) had diabetes and hypertension as previous comorbidities and 19.4% (n=6) were just hypertensive. There was a predominance of cardiovascular disorders as a reason for hospitalization, namely: ischemic stroke 45.2% (n=14) and hemorrhagic stroke 16.1% (n=5).

Table 2 shows the distribution of patients for each assessment item according to the MFS. The results were organized according to the patients' evaluation period, performed upon admission, after 15 days of stay (reassessment) and at discharge.

Table 3 describes the distribution per patient of the results of the variables on the STRATIFY scale in relation to the risk factors for falls identified at admission, reassessment and discharge, which corresponded to the evaluation period of the study participants.

In the item that investigates the transferability and mobility of the

participants, only 45.2% (n=14) had a score of 3 or 4 at hospital discharge, being considered independent enough to perform a transfer from a bed to a chair, as well as in relation to their mobility; meanwhile 83.9% (n=26) since admission showed a pattern of dependence for carrying out transfers and moving.

Combined with this, the relationship between transfer and mobility was investigated, where 35.5% (n=11) received a score of zero upon admission (the patient was unable to transfer from a bed to a chair), and later 22.6% (n=7) had a score of 1 (needed much help), 9.7% (n=3) had a score of 2 (needed little help), and 32.2% (n=10) received a score of 3 points (independent in the transfer) during discharge. As for the level of mobility of the interviewees, 38.7% (n=12) received a score of zero upon admission (immobile), while 22.6% (n=7) had a score of 2 (used the aid of a walker or a person), 6.5% (n=2) were independent with the aid of a wheelchair having a score of 1, and 32.2% (n=10) were independent and had a score of 3 at discharge.

Table 4 describes the comparison between the MFS and STRATIFY scales in order to demonstrate the risk classification for falls according to each one. The results were distributed by the number of patients who received the classification for risk of falls according to the corresponding scales, and according to the period that was evaluated, that is, the same patient obtained a heterogeneous result during the hospitalization.

Table 5 describes the proportionality measures of the main sociodemographic risk factors of the patient and the level of significance correlated with the risk classifications for the scales used.

Table 1 – Distribution of hospitalized elderly according to sociodemographic variables, Campo Grande, MS, Brazil, 2018 (n = 31).

Variables		%	N
Age (General)		Mean ± SD	CI95%
		69.4 ± 7,1	2.5
Age groups			
	60 ⊦ 69 (years)	61.3	19
	70 ⊦ 79 (years)	29.0	9
	80 years or older	9.7	3
Sex			
	Male	61.3	19
	Female	38.7	12
Marital status			
	Married	22.6	7
	Widowed	22.6	7
	Divorced	25.8	8
	Single	29.0	9
Ethnicity / color			
	White	38.7	12
	Black	22.6	7
	Brown	38.7	12
Education			
	Without Education	22.6	7
	Elementary School I.	64.5	20
	Elementary School C.	3.2	1
	High School C.	9.7	3
Monthly income			
	1 minimum wage	71.0	22
	> 1 to 2 minimum wages	29.0	9
Lives alone?			
	Yes	161.	5
	No	83.9	26
Home Age (General)			
	Own	61.3	19
	Rented / loaned	38.7	12

I: incomplete; C: complete; SD: standard deviation; CI95%: 95% confidence interval. *Minimum wage in 2018: R$ 954.00.

Table 2 – Distribution of hospitalized elderly according to the MFS domains at admission, reassessment and discharge, Campo Grande, MS, Brazil, 2018 (n = 31).

Risk assessment factors	Admission	Reassessment	Discharge
		N (%)	
Risk assessment factors			
Yes	10 (32.3)	11 (35.5)	13 (42.0)
No	21 (67.7)	20 (64.5)	18 (58.0)
Secondary Diagnosis			
Yes	30 (96.8)	31 (100.0)	30 (96.8)
No	1 (3.2)	0 (0)	1 (3.2)
Assistance in walking			
None/Bedridden/Assisted by Health Professional	24 (77.5)	20 (64.5)	16 (51.6)
Crutches/Cane/Walker	3 (9.6)	6 (19.3)	10 (32.2)
Furniture/Wall	4 (12.9)	5 (16.2)	5 (16.2)
Use of intravenous device			
Yes	8 (25.8)	25 (80.6)	25 (80.6)
No	23 (74.2)	6 (19.4)	6 (19.4)
Gait			
Normal/Sem deambulação, Acamado, Cadeira de Rodas	24 (77.5)	21 (67.8)	20 (64.5)
Fraca	4 (12.9)	5 (16.1)	5 (16.1)
Comprometida/ Cambaleante	3 (9.6)	5 (16.1)	6 (19.4)
Mental State			
Oriented/competent as to his/her capacity/limitation	20 (64.5)	18 (58.0)	18 (58.0)
Overestimated capacity/ Forget limitations	11 (35.5)	13 (42.0)	13 (42.0)

MFS: Morse Fall Scale.

Table 3 – Distribution of hospitalized elderly according to STRATIFY domains at admission, reassessment and discharge, Campo Grande, MS, Brazil, 2018 (n = 31).

Risk assessment items	Admission	Reassessment	Discharge
		N (%)	
Patient hospitalized because of a fall or with a fall episode during hospitalization			
Yes	9 (29.0)	10 (22.6)	12 (38.7)
No	22 (71.0)	21 (67.7)	19 (61.3)
Agitated patient			
Yes	15 (48.4)	5 (16,1)	5 (16.1)
No	16 (51.6)	26 (83.9)	26 (83.9)
Patient with visual changes that affect their daily activity			
Yes	20 (64.5)	18 (58.1)	20 (64.5)
No	11 (35.5)	13 (41.9)	11 (35.5)
Patient needing to use bathroom frequently			
Yes	7 (22.6)	10 (32.3)	10 (32.3)
No	24 (77.4)	21 (67.7)	21 (67.7)
Does the patient have a transfer or mobility score			
Yes	5 (16.1)	12 (38.7)	14 (45.2)
No	26 (83.9)	19 (61.3)	17 (54.8)

STRATIFY: St Thomas's Risk Assessment Tool in Falling Elderly Inpatients.

Table 4 – Descriptive statistics and distribution of patients classified as at-risk of falls according to MFS and STRATIFY upon admission, reassessment, and discharge. Campo Grande, MS, Brazil, 2018 (n=31).

Risk classification for falls	Mean ± SD	N	%
MFS - Admission	40.81 ± 20.4		
Absent		6	19.4
Low		18	58.0
High		7	22.6
MFS - Reassessment	45.97 ± 20.79		
Absent		4	12.9
Low		17	54.8
High		10	32.3
MFS - High	49.68 ± 21.91		
Absent		4	12.9
Low		13	42.0
High		14	45.1
STRATIFY - Admission	1.68 ± 0.98		
Low		3	9.7
Moderate		11	35.5
High		17	54.8
STRATIFY - Reassessment	1.58 ± 0.92		
Low		4	12.9
Moderate		10	32.3
High		17	54.8
STRATIFY - High	1.81 ± 0.91		
Low		2	6.4
Moderate		9	29.0
High		20	64.6

MFS: Morse Fall Scale; STRATIFY: St Thomas's Risk Assessment Tool in Falling Elderly Inpatients
Notes: * MFS scale score: 0-24, no risk; 25-50, low risk; ≥ 51, high risk; † STRATIY scale score: 0, low risk; 1, moderate risk; 2 or more, high risk.

to be continued...

Table 5 – Correlation of sociodemographic variables with risk classification using the STRATIY and MFS scale, Campo Grande, MS, Brazil, 2018. (n=31).

Variables	%	N	Mean ± SD (CI95%) STRATIFY	Mean ± SD (CI95%) MFS	p-value STRATIFY p-value MFS
Risk of falls (S *):			1.8 ± 1.0 (0.4)		
Low risk	9.7	3			
Moderate risk	25.8	8			
High risk	64.5	20			
Risk of falls (M †):				48.1 ± 20.7 (7.3)	
No risk	19.4	6			
Low risk	58.1	18			
High risk	22.6	7			
Sex:					0.08 0.51
Male			2.1 ± 1,0 (0.4)	44.2 ± 22.7 (10.2)	
Female			1.4 ± 0,9 (0.5)	35.4 ± 16.7 (9.5)	
Age range:					0.30 0.07
60 ⊦ 69 years			1.9 ± 1,6 (0.49)	44.2 ± 19.7 (8.8)	
70 ⊦ 89 years			1.6 ± 0,8 (0.45)	35.4 ± 22.1 (12.5)	
Marital status:					0.16 0.12
Married			2.3 ± 1.0 (0.7)	52.9 ± 22.0 (16.3)	
Widowed			1.4 ± 0.8 (0.6)	28.6 ± 14.9 (11.1)	
Divorced			2.1 ± 1.0 (0.7)	35.6 ± 14.7 (10.2)	
Single			1.4 ± 1.0 (0.8)	45.6 ± 24.2 (15.8)	
Ethnicity/color:					0.90 0.66
White			1.8 ± 1.0 (0.6)	42.5 ± 25.8 (14.6)	
Black			1.7 ± 0.8 (0.6)	38.6 ± 27.9 (20.7)	
Brown			1.8 ± 1.1 (0.6)	40.4 ± 8.6 (4.9)	
Monthly income:					0.44 0.58
Up to 1 M.W.			1.7 ± 1.1 (0.5)	41.1 ± 22.7 (9.5)	
1 to 2 M.W.			2.0 ± 0.5 (0.3)	40.0 ± 16.0 (10.5)	
Live alone?					0.30 0.91
Yes			2.2 ± 0.8 (0.7)	39.0 ± 8.9 (7.8)	
No			1.7 ± 1.0 (0.4)	41.2 ± 22.4 (8.6)	
Home:					0.98 0.73
Own			1.8 ± 1.0 (0.4)	43.2 ± 22.8 (10.3)	
Rented/leased			1.8 ± 1.1 (0.6)	37.1 ± 17.2 (9.8)	

SD: standard deviation; CI95%: 95% confidence interval; MW: minimum wage; STRATIFY: St Thomas Risk Assessment Tool in the Falling Elderly Inpatients; p-value: Significance level p <0.05. S*: STRATIFY; M†: Morse Fall Scale.
Notes: ‡ MFS scale score: 0-24, no risk; 25-50, low risk; ≥ 51 high risk; § STRATIY scale score: 0, low risk; 1, moderate risk; 2 or more, high risk.

DISCUSSION

Similar studies corroborate the socio-demographic and health profile of this study, such as the predominance of males, those who received up to 1.5 minimum wages and low level of education, as well as the prevalence of cardiovascular diseases as the major cause of hospitalization of elderly population, as well as the emphasis on hypertension concomitantly with polypharmacy[16-17]. In addition to the cardiovascular diseases identified, there was also a predominance of neurodegenerative diseases, which the present study did not present[18].

This study pointed out the only factor that showed a higher rate of significance on the MFS scale in patients with falls compared to patients who did not fall was altered mental status. Other studies that evaluated the risk of falling in rehabilitation settings found that specific cognitive deficits, dependence in performing activities of daily living can provide valid information to assess the risk of falls[19].

In this study, it was found that both instruments used to indicate the risk factors for falls, have similar assessment items with regard to the history of falls, agitation versus mental state and mobility or transfer versus walking aid. However, MFS investigates potential physiological risk factors for the falling event in patients over 18 years old, while STRATIFY points to more frequent risk factors in the elderly, such as visual changes, the need to use the bathroom frequently and transferability and mobility[12, 15].

It is important to note that the mobility research axis is similar for the two scales, with the MFS evaluating walking and walking aids as correlated items and STRATIFY uses the combined transfer and mobility scores.

In this sense, the results showed that 83.9% (n=26) were elderly people who depend on help for the transfer and mobility indicated by STRATIFY, due to staying in bed or being assisted by a health professional, and 77.5% (n=24) did not need any assistance in walking, as demonstrated by the MFS. It was also evident that as the participants gained independence in mobility (32.2%; n=10), using some device to walk, they increased the chances of falling, concomitantly.

Some studies have shown that the majority of falls occur in the absence of the professional at the time of the episode, reduced muscle strength, visual impairment, overestimation of the ability to walk and the high risk ratings by the MFS were associated with falls during hospitalization[20-23]. In addition, with the advent of independence, there is also a variance in the gait characteristic assessed by the MFS. Studies corroborate that impaired/staggered gait is a relevant factor in establishing a high risk for falls[20-21, 23].

The role of health professionals in preventing falls in the face of the risk identified by the predictive instruments should prioritize the patient's assessment of their autonomy and the need to insert the use of walking accessories. The orientation of patients and companions towards making them partners in care emerges as an important strategy, because as they are able to perceive their limitations related to impaired mobility, it becomes easier to request help[23-24].

Regarding the risk factors for falls, another study stated that, in hospitals, the history of previous falls was strongly related to the occurrence of new falls25. This was confirmed in the present study. Thus, STRATIFY showed that the items referring to the history of falls represented the highest probability of occurrence of falls, in relation to any other item. Regarding the questioning about the history of falls, the instruments use this data as a determining factor for new

occurrences; however, STRATIFY limits the information, questioning only the occurrence of a fall in the current hospitalization, while the MFS expands to a history of falls over the previous three months.

STRATIFY inquires about the visual changes that affect the individual's daily activity, and in this study the number of patients with this change was high 64.5% (n=20). Coupled with this, there was also a predominance of patients who needed to use the bathroom frequently, about 32.2% (n=10). It is possible to note that these two assessment items were significant for classifying the patient as high risk for falls; in contrast, the instrument does not measure the quantity of bathroom use, making the data subjective. The work carried out with patients with visual impairment identified it as an important risk factor, due to its statistical association with the occurrence of falls, showing that 88.6% of those who fell had this condition21. In another study, they correlated that loss of visual acuity can also be a factor related to the loss of balance26.

It is important to note that both instruments were built to be used in hospital environments, as they provide an objective basis for nursing assistants, preventing a falling event in the elderly[17]. Some studies carried out in the northern and southern regions of Brazil, when assessing the risk of falls according to MFS, identified a high risk for this event in the majority of the elderly. Moreover, the group that demonstrated falls was associated with high risks according to the scale[16, 21].

The present study, on the other hand, demonstrated heterogeneous results when comparing the MFS and STRATIFY instruments. In the former, patients with a minimum stay of 15 days were classified as low risk of falls, and only at hospital discharge were they at a high risk. These numbers identified using the MFS scale corroborate the rate of falls reported in the unit (n=10) during the months of the study, showing that the MFS demonstrates that as the patient obtains mobility, the risk for falls increases. On the STRATIFY scale, when investigating risk factors directed at the elderly, increased levels of high risk of falls were identified in the three moments of assessment.

Of the patients who were assessed as low risk of falls according to the MFS, two studies indicate that about 37.5% suffered a fall over a six-month period, and of those events, 21.5% occurred in the bathroom. It is noteworthy that identifying whether the patient uses the bathroom regularly increases the chance for the fall event, however only the STRATIFY scale signals this risk[18, 20].

In the study that used STRATIFY as a research object pointed out that this instrument can be used to observe the ability of balance, awareness and visual acuity in the elderly, since its sensitivity and specificity reach 87% in the identification of falls, and it can be considered effective in predicting falls, specifically for more fragile elderly people, due to their unstable gait and poor vision17. Another study carried out in Campo Grande, MS in 2020 concluded that elderly people in the advanced age group have a higher risk of falling compared to younger people[27].

However, an important study applied STRATIFY to patients recovering from acute stroke and identified a poor performance in predicting falls in hospitalized patients in the first 28 days; that is, it performed poorly as a predictor of falls in stroke patients, with a sensitivity of 11.3% and specificity of 89.5%, suggesting the need for the insertion of a disease-specific rather than generic risk assessment[28].

Authors investigated the effectiveness of preventing fall risk between MFS and STRATIFY noted that although the predictive value of an assessment tool may be satisfactory under a certain condition,

the evidence and effectiveness of the tool remains generally insufficient9. Both have adequate predictive efficacy for patients receiving acute hospital treatment, among which the diagnostic validity of STRATIFY was the highest[29].

Another study corroborates that the STRATIFY instrument can be considered the best tool to assess the risk of falls in adults with acute hospitalized diseases. However, both this scale and the MFS vary considerably depending on the population and the environment in which they will be applied, and therefore, their operation must be tested before implementation. The top characteristic of the STRATIFY tool was that the instrument was completed more easily and in less time. In addition, it also had the best predictive validity and it was readily understandable by the team[30-31].

Moreover, we highlight the importance of carrying out the risk assessment for falls in more than one moment during hospitalization. One study showed that the assessment of the risk of falling performed only at the time of hospital admission does not identify changes in the clinical status of patients during hospitalization, especially among the elderly, who may be disoriented, agitated or lose functionality during hospitalization and, therefore, be at a greater risk of falling. Therefore, hospitals need an instrument that can be used quickly and easily, so that repeated evaluations of these patients can be performed[25].

The scales were applied in a unit that serves elderly people, who, after an acute process of some disease, needed assistance aimed at physical, psychological and social rehabilitation, in order to resume their activities of daily living or even seek some quality of life. When analyzing the risk scores indicated by the MFS and STRATIFY scales, during three moments of hospitalization (at admission, after 15 days and at discharge), the scales differed in their results. The MFS classified them as low risk in all the screenings and increased to high risk during discharge for those who obtained mobility, while the second instrument stood out for indicating high risk of falling in the three investigated moments.

The explanation for this discrepancy comes from the objectivity of the content in the STRATIFY test that can be used to observe the subjects' ability to balance, but also their consciousness and vision. Therefore, foreign experts suggest that this instrument can be considered a simple method for the basic movement capacity of the elderly population. They have greater sensitivity and expertise in assessing the risk of falling, but their points of emphasis are different; therefore, in the clinic, nurses should adopt them based on the characteristics and needs of the elderly[17].

We suggest future intervention studies that identify the best screening instrument to be used during the hospitalization of elderly patients, both hospitalized and in rehabilitation, in order to describe the risk factors that influence the prediction of falls.

CONCLUSION

STRATIFY was significantly associated with the risk of falling and had better discrimination in predicting falls in hospitalized elderly than MFS. The components of visual changes, the need to use the bathroom frequently and the specific transfer capacity of this scale are not present in the MFS and were risk factors for falling. Further research is needed to assess the predictive value of fall scales that include

neurological deficits.

For nurses working in the field of Geriatrics and Gerontology, this study may contribute towards demonstrating which scale to use in screening for the risk of falls in the elderly, since this instrument will need to meet the main risk factors that contribute to this event. In addition, the use of the scale needs to be easy to understand and quick to apply for professional nurses. In this sense, we highlight the importance of carrying out the risk assessment for falls in more than one moment during hospitalization, due to the changes suffered in the profile of the hospitalized patient, especially in the elderly.

Considering the vast number of instruments available in the literature, it is suggested to the professional nurse that before implementing a scale for risk of falling in a hospital, it is important that this instrument be tested by them, according to the environment and profile of the assisted population. Moreover, taking into account the findings of this study, where the MFS scale demonstrated that as the patient obtains mobility, the risk for falls increases. Also, the STRATIFY scale pointed out that the visual deficit combined with the use of the bathroom often increases the risk of falling. Thus, STRATIFY pointed out greater effectiveness in the prediction of falls specifically for more fragile elderly, due to their unstable gait and poor vision.

It is concluded that the instruments for predicting falls need to be implemented in the daily routine of the nurse, in order to prevent this event considering the risks and consequently the potential injuries. In addition to this, it is suggested that health institutions include preventive measures for falls, which mainly concern the elderly. The limitations of this study must be considered, mostly due to the epidemiological method and sample size. New research in this scenario needs to be carried out due to the impact of this event on the hospitalized person.

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