

Functional evaluation of aged with fractures at hospitalization and at home

AValiação Funcional de Idoso Vítima de Fraturas na Hospitalização e no Domicílio*

Evaluación Funcional del Anciano Víctima de Fracturas en la Hospitalización y en el Domicilio

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ABSTRACT

Trauma is often related to functional impairment, representing an important social, economic and health issue. This study intended to evaluate the functional independence of aged individuals with fractures, at admission, discharge and after one month from their regressing home. Furthermore, this study also intended to verify the relationship between functional independence and demographic and health variables. Thirty-four aged individuals hospitalized at the Orthopedics and Traumatology Institute of the University of São Paulo Faculty of Medicine were interviewed and submitted to the application of the Functional Independence Measure (FIM). Among all fractures, 67.6% were femur fractures. The motor and total FIM scores increased at discharge; on the other hand, the total FIM score decreased one month after their returning home. Functional impairment increased with age and also with longer length of stay. Hypothyroidism was related to cognitive impairment, while dementia and depression were related to motor impairment.

KEY WORDS

Aged.
Wounds and injuries.
Rehabilitation.
Orthopedic nursing.
Rehabilitation nursing.

RESUMO

O trauma frequentemente está associado à incapacidade funcional, tornando-se uma importante questão social, econômica e de saúde. O estudo busca avaliar a independência funcional de idosos com fratura, na admissão, alta, e após um mês em domicílio, e também verificar suas relações com as variáveis demográficas e de saúde. Trinta e quatro idosos hospitalizados no Instituto de Ortopedia e Traumatologia do HCFMUSP foram entrevistados e submetidos à aplicação da Medida de Independência Funcional (MIF). Das fraturas, 67,6% eram de fêmur. Os valores da MIF motora e total aumentaram na alta; já os valores da MIF total diminuíram após um mês em domicílio. A incapacidade funcional aumentou com a idade e para um maior número de dias de internação. O hipotireoidismo foi associado à incapacidade cognitiva, ao passo que a demência e a depressão foram associadas à incapacidade motora.

DESCRIPTORES

Idoso.
Ferimentos e lesões.
Reabilitação.
Enfermagem ortopédica.
Enfermagem em reabilitação.

RESUMEN

El trauma es frecuentemente asociado con la incapacidad funcional, convirtiéndose en un importante tema social, económico y de salud. El estudio busca evaluar la independencia funcional de ancianos con fracturas en la admisión, al momento del alta y después de un mes en domicilio, incluso así como verificar sus relaciones con las variables demográficas y de salud. Treinta y cuatro ancianos hospitalizados en el Instituto de Ortopedia y Traumatología del HCFMUSP fueron entrevistados y sometidos a la aplicación de la Medida de Independencia Funcional (MIF). Las fracturas fueron del fémur en un 67,6%. Los valores de la MIF motora y total aumentaron para el momento del alta; ya los valores de la MIF total disminuyeron después de un mes en domicilio. La incapacidad funcional aumentó con la edad, haciendo necesario un mayor número de días de hospitalización. El hipotiroidismo se asoció a la incapacidad cognitiva, mientras que la demencia y la depresión se asociaron a la incapacidad motriz.

DESCRIPTORES

Anciano.
Heridas y traumatismos.
Rehabilitación.
Enfermería ortopédica.
Enfermería em reabilitación.

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INTRODUCTION

Along with the demographic transition that indicates population aging, the prevalence of trauma among the aged has increased significantly over the last years, especially in large urban areas, which assigns an increasing relevance to geriatric traumatology⁽¹⁾.

Some factors that explain those data are the high concentration of aged individuals in urban areas, the fact that many have exercised more, the lack of accessibility to public and domestic facilities, including public areas that favor the traffic of motor vehicles over that of pedestrians.

In addition, there are many other intrinsic factors that may increase trauma among the elderly: the losses due to the physiological loss that are part of the process of aging, such as changes to the cardiac, nervous, sensorial, and musculoskeletal systems, especially changes to the individuals' vision, hearing, smell, gait, balance, motor coordination and reaction time⁽¹⁻⁵⁾.

Furthermore, the coexistence of systemic diseases and the consequent use of various medications predispose the aged to the risks of trauma. Using medications such as anti-depressives, psychotropics, anisoliotics and hypnotics, sedatives, anti-hypertensives, and diuretics increase the propensity of trauma because of the cumulative side effects, interactions with other drugs or orthostatic hypotension⁽¹⁻⁵⁾.

We cannot deny that the excessive alcohol use is a common problem among the aged. Changes in conducts, balance, and gait due to alcohol use cause consequences such as a great number of injuries because of falls, run over accidents, collisions and aggressions⁽¹⁻⁵⁾.

Several studies about mortality/morbidity due to external causes^(1,3-6) have shown that the leading trauma among involving aged individuals are falls, followed by traffic accidents.

One study⁽⁷⁾ performed in Southern Brazil showed that hospitalizations due to falls represented the majority of the injuries registered in the Authorizations for Hospitalizations (AIHs, acronym for *Autorizações de Internação Hospitalar*): 62.5% of all thigh and hip traumas, 36% of lower limb traumas, 37.5% of head and neck, and 66.7% of other locations, such as thorax, abdomen and multiple traumas.

The main consequences of traffic accidents are fractures (45%), mostly affecting the lower limbs (29.2%), especially the femur (19.3%), followed by intracranial traumas (14.4%), upper limb fractures (12.1%) and multiple fractures (11.9%). Among the types of accidents, run overs are the most relevant, accounting for 54.5% of those hospitalizations⁽⁵⁾.

From the perspective of collective health, functional capacity appears as a new component of the health concept,

and is appropriate for motivating and implementing a health care policy for the elderly.

Functional capacity refers to the capacity of maintaining one's physical and mental abilities required to maintain an independent and autonomous life. Therefore, according to the latest gerontological concepts, aged individuals who maintain their autonomy and abstract from any help or supervision to perform their daily activities should be considered healthy, regardless of their bearing one or more chronic diseases⁽⁸⁾.

Senescence, *per se*, causes loss of functional capacity, which worsens after the age of 75 years and makes important limitations; however, an event such as trauma, which could cause fracture, could have catastrophic implications such as the temporary or even permanent end of an autonomous and independent life.

In Brazil, few functional assessment instruments have been widely used and testes in regards to their specificity, sensitivity and reliability. A study⁽⁹⁾ involving stroke patients showed that the Brazilian version of the Functional Independence Measure (FIM) was sensitive to changes and clinically useful to assess rehabilitation outcomes in subacute and chronic outpatients in Brazil.

In Brazil, the elderly population has not been the priority in studies about external causes and few address the sequelae and the quality of life after a traumatic event. Furthermore, trauma is often associated to sequelae, disabilities, impairments, and reduced functional capacity, thus harming the quality of life of victims and their families due to the loss of autonomy and independence, and is therefore an important issue from social, economic and health perspectives.

Taking into consideration the occurrence of fractures by trauma in the elderly, its impact on their functional capacity and quality of life, as well as on family dynamics, the general objective of this study was to assess the functional independence of elderly fracture victims, when they are admitted to hospital, at discharge, and one month after their returning home, and verify its relationships with demographic and health variables.

METHOD

This is a longitudinal, exploratory and descriptive study that used a quantitative approach. Participants were thirty-four aged individuals, trauma victims who were hospitalized in the trauma-geriatrics ward and in the emergency room of *Instituto de Ortopedia e Traumatologia do Hospital das Clínicas da USP* (Institute of Orthopedics and Traumatology at University of São Paulo Clinics Hospital), a reference center for the care to patients with injuries to the locomotor apparatus.

From the perspective of collective health, functional capacity appears as a new component of the health concept, and is appropriate for motivating and implementing a health care policy for the elderly.

Data collection was performed after receiving the approval by the University of São Paulo School of Nursing Ethics Committee and authorization from the Scientific Commission of the Orthopedics Institute. The researcher read the free and informed consent form to the aged patients, and to his or her caregiver if needed, and then began the interviews, following a structured script; in addition, the FIM was applied three times: before completing 48 hours of hospitalization, at their discharge from the hospital and one month after the aged patient returned home, the latter was performed over the phone.

The FIM assesses 18 functional, 13 motor and five cognitive activities. Each item is scored from one to seven, according to the level of dependence. The motor items are subdivided into dimensions regarding to self-care, sphincter control, transfers and locomotion. Cognitive items were separated into communication and social cognition dimensions⁽⁹⁾.

Reliability was analyzed using Cronbach's Alpha and Interclass Correlation Coefficient.

Pearson's Correlation Coefficient was used to verify the relationship of total FIM and the domains with the variables: age and length of stay.

With a view to identify changes to the aged patients' functional independence in the aforementioned times, and with the purpose to verify the effect that independent variables have on dependent variables, Bonferroni's multiple two-by-two comparison tests were used.

The dependent variable (social cognition domain), which did not present a normal distribution, was normalized and re-transformed by means of the technique Generalized Linear Models for Repeated Measures.

In the present study, statistical significance was defined at the 5% level and for a descriptive p smaller than or equal to 0.05.

RESULTS AND DISCUSSION

The sample consisted of aged patients with an average age of 75.47 years, 16 of which were men and 18 were women. Most participants (82.4%) were white.

The high incidence of white individuals in the present study may still be a reflex of the majority (70.29%) of the population self-declared as being white in the State of São Paulo, as shown by the study: *Saúde Bem-Estar e Envelhecimento* (which may be translated as: *Health, Wellbeing, and Ageing*)⁽¹⁰⁾.

As for the family composition of the elderly, there was prevalence for a single generation, as most aged patients lived with their spouses and/or children. The families faced successive structural changes. They became more and more nuclear and the roles of the family members were changed. Those factors made it more difficult for the family to partici-

pate in the care to the aged individual, which could cause a care need among the elderly patients with more disabilities.

When asked about leisure activities and their engagement in physical activities before the trauma, 50% of the aged patients did not report any activities, and only 11.8% claimed they exercised on a regular basis, with walking being the only mentioned activity.

It has been considered that engaging in physical activities is a fundamental lifestyle aspect for promoting healthy and successful ageing. Hence, the sedentary lifestyle presented by the aged participants of the present study consists of a worrying finding that could be related to lack of knowledge among the patient, his or her family and/or including among some health professionals that still believe that physical activity is recommended only for young, healthy individuals without any disability or dependences. Furthermore, it should also be considered that this age group has a limited number of activity choices in their communities.

The interviews showed that 70.6% of the aged patients performed the addressed practical life activities, as follows: performing domestic activities, going to the bank and supermarket. That means that the sample was mainly composed of individuals who were independent for the Activities of Daily Living and Practical Life Activities before the trauma event.

Femur fractures accounted for 67.6% of all fractures, with emphasis on proximal-third femur fractures, especially transtrochanteric and femur neck fractures, respectively. Femur fractures have been reported as a common and important cause of mortality and functional loss among the elderly, especially proximal fractures. It poses a high social burden, as the elderly often require intensive medical care and long rehabilitation programs.

Falls were the main trauma mechanism accounting for fractures among the elderly (88.2%). The patients' home was the main location of the falls, followed by public areas.

The high number of falls at home could be explained by the fact that aged individuals fall at home because that is where they spend most of their time. Older individuals in the age group addressed in the present study rarely leave their home, mostly because of their physical and/or social condition (few friends, limited financial condition, living far from the city and others).

Furthermore, there are several impediments and facilitators for general falls at home. In the bedroom, tall beds, loose rugs; in the bathroom, low toilet, absence of a support bar; in the living room, bad lighting, objects spread around the floor, slippery floor, and unstable chairs without arms. Allied with the fact that aged people stay home for longer periods, another factor that contributes with this aspect is family members' and caregivers' lack of knowledge regarding the measures to prevent falls among the elderly⁽¹¹⁾.

The duration of hospital stay ranged from 4 to 30 days with an average 15.47 days of hospitalization, showing the heterogeneity of the subjects.

The mode of treatment used was surgery. The most used osteosynthesis (29.41%) was the Dynamic Hip Screw (DHS), a data perfectly in line with the high number of transtrochanteric fractures. DHS was followed by partial and total hip arthroplasties corresponding to the treatment for femur neck fractures and plate and screw systems.

Only 26% of the aged subjects had a permanent caregiver, which may be explained by the limitation of nuclear families to accompany the patient. On the other hand, there is still a need for changing the structure, philosophy and attitude of the institution to encourage and facilitate the permanence of caregivers with the aged patients.

In the third collection data period, one month after the patient had returned home, the individuals were interviewed about their attending physiotherapy. Only 50.0% of them had engaged in some kind of physiotherapy activity.

As for the internal consistency of the FIM domains, value greater than 0.80 were obtained for the three assessment times.

Table 1 - Cronbach's alpha values for FIM motor and social cognition domains considering the assessment times - São Paulo - 2007

Domain	Admission	Discharge	Home
Motor	0.84	0.899	0.832
Social cognition	0.822	0.851	0.839

Therefore, the agreement between the two different assessment times was confirmed by applying the Interclass Correlation Coefficient (ICC), as shown in the following table:

Table 2 - Interclass Correlation Coefficient values at the different assessment times - São Paulo - 2007

Moment	ICC
Admission – Discharge	0.795
Discharge – Home	0.911
Admission – Home	0.892

We observed that there was an increase in the mean FIM scores regarding motor FIM and, therefore, total FIM at discharge, suggesting a gain in functional independence compared to immediately after the trauma. On the other hand, we observed that the functional gain for motor FIM was reduced after the aged patients were discharged; i.e., when interviewed one month after having returned home. As for the social cognition domain, the mean presented an

insignificant variation between the assessed times, thus maintaining a linear standard.

Table 3 - Scores for total FIM and its domains at different assessment times - São Paulo - 2007

FIM	N	Minimum	Maximum	Mean	Possible variation
Motor - Admission	34	15	70	33.09	(13 - 91)
Motor - Discharge	34	18	85	61.29	
Motor - Home	34	18	70	39.59	
SC* - Admission	34	16	35	30.35	(5 - 35)
SC* - Discharge	34	16	35	30.53	
SC* - Home	34	13	35	29.76	
Total - Admission	34	40	105	63.44	(18 - 126)
Total - Discharge	34	34	119	91.82	
Total - Home	34	31	105	69.35	

Other two American studies⁽¹²⁻¹³⁾ involving aged individuals, victims of femur fractures who were in a rehabilitation program showed that there was a significant increase in motor FIM scores at discharge.

Hence, we may infer that the increase in motor FIM scores observed in the present study are due to the fact that the aged patients involved had suffered an acute injury, and, after stabilizing the fracture, adequate analgesia and physiotherapy intervention, they felt more capable and willing to perform their activities within the limitations imposed by temporary immobilization.

The lack of variation in the social cognition domain during the period of assessment was also observed in previous studies using the FIM to verify the evolution of functional independence in aged individuals who were hospitalized^(12,14).

In the present study, aged subjects with cognitive changes were a minority 32.3%, and perhaps that is the reason why no statistically significant changes were observed in the social cognition domain.

The loss of functional independence observed in aged patients at home may be explained by the rate of their engagement in physiotherapy (50%), the protectionism from their family, who do all the patient's activities because they consider the patient incapable of doing them, or because they see it as a form of expressing their care and love towards the convalescent patient. Furthermore, it should be considered that there are architectural barriers imposed by the household, which hinders aged patients from moving and from performing their activities.

Pearson's Correlation Coefficient revealed negative correlations: it was observed that functional incapacity increased with age and there was a significant association between greater functional impairments and longer length of stay.

Table 4 - Pearson's Correlation Coefficient for the domains at different assessment times - São Paulo - 2007

	Length of stay		Age	
	Coefficient	P	Coefficient	P
FIM motor 1	-0.446	0.008	-0.368	0.032
FIM motor 2	-0.333	0.054	-0.542	0.001
FIM motor 3	-0.442	0.009	-0.475	0.005
SC FIM* 1	-0.476	0.004	-0.419	0.014
SC FIM* 2	-0.523	0.002	-0.428	0.012
SC FIM* 3	-0.508	0.002	-0.451	0.007

* SC FIM= social cognition FIM

A prolonged length of stay is a concern when it involves elderly patients considering the possibility of complications and, especially, the functional loss to which they are vulnerable. Furthermore, the referred relationship between functionality and length of stay reflects the quality of the hospital services, considering specialized care and rehabilitation.

The adjusted Bonferroni test showed that, regarding total FIM, there was a significant difference between the means referring to the lack of a caregiver ($p=0.038$; mean=64.41) and their continuous presence ($p=0.044$, mean= 92.99).

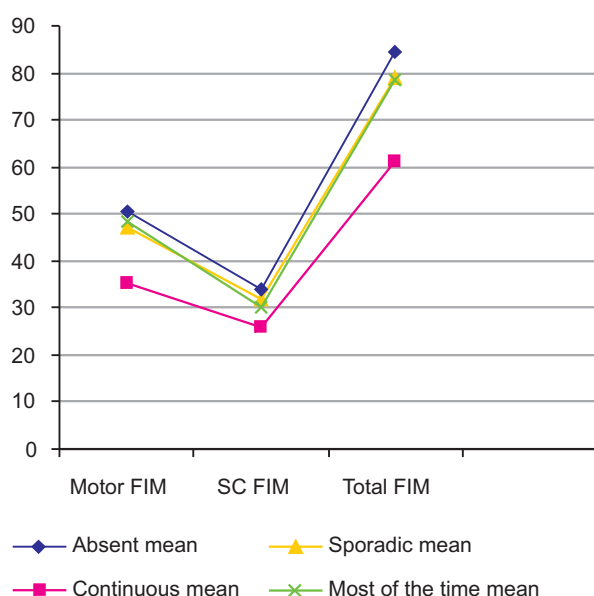


Figure 1 - Mean score variations for total FIM and its domains according to the presence of a caregiver - São Paulo - 2007

This finding may be explained by the motor and cognitive stimulation provided by most of the caregivers. The protectionism from the nursing staff, performing activities for the aged patients claiming a lack of time or of staff is perhaps the strongest cause for the low FIM scores.

The relative may begin to collaborate with the patients so they can face the changes in their life and the limitations caused by their health condition. It is the nursing staff's

duty to establish a partnership with the caregiver seeking to improve the care to the aged patient⁽¹⁵⁾.

When the effect of the aged patients' underlying diseases on their functional independence scores is studied, it is evidenced that patients with hypothyroidism have low scores for social cognition FIM whereas patients with dementia and depression present more dependence in the motor domain.

It may be inferred that the difference between the scores for health individuals and patients with hypothyroidism is perhaps due to a series of symptoms presented by the latter, including: a slow mental process and speech, onset of deafness, apathy, depression and changes to personality and cognition in advanced cases⁽¹⁶⁾.

The low scores obtained by individuals with dementia may be explained by the fact that patients with that diagnosis present compromised gait, unbalance, postural instability and increased muscular tonus, which may have been factors that led to their dependence on others to perform activities of daily living, besides compromising their attention and recent and acquisition memory⁽¹⁷⁾.

In the case of depression, it should be considered there is a greater prevalence of chronic diseases, greater use of anti-depressive and sedative/hypnotic medication, poor health and physical loss, reduced self-confidence, indifference towards the environment, reclusion and inactivity, all of which are factors that may have contributed for the occurrence of the trauma⁽¹⁸⁾.

Gender, marital status, type of fracture, and affected body region were not determinants of variations in the functional state of the aged subjects.

CONCLUSION

In the present study, it was observed that there was a considerable increase in the mean motor and total FIM scores at discharge compared to admission, but when compared to the scores reached at home, we observed there was a reduction in the mean score for total FIM, compared to the scores observed at discharge.

It was also observed that functional incapacity increased with age, and there was a significant association between greater functional disabilities and a longer length of stay.

The continuous presence of a caregiver is a factor that protects against functional capacity.

Hypothyroidism was associated to lower scores in the social cognition domain, whereas dementia and depression were associated to higher rates of dependency in the motor domain.

Gender, marital status, type of fracture, and affected body region were not determinants of the influence on the functional state of the aged subjects.

Hence, as presented, we may infer that functional capacity may be influenced by various factors, and, therefore, health care practice and public policies should include not only measures of intervention but also of prevention, including the management of the aged patient's environment so that they may circulate free and safely, controlling the underlying diseases, orienting caregivers and relatives, and encouraging aged patients to participate in physical activity programs.

We believe there is a need to prepare health professionals in terms of assessing aged individuals in terms of their functional capacity, meeting their needs and designing plans that aim at minimizing their disabilities.

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