

**ARTIGO
ORIGINAL****Evolution of the functional independence of elderly patients from a home care service through the point of view of caregivers**Natalia Aquaroni Ricci¹, Naira Dutra Lemos², Karine Fróes Orrico², Juliana Maria Gazzola²**ABSTRACT**

The knowledge of the performance of the aged one in its activities have a major importance in the home care services, because it is the objective of professionals and caregivers during health care. The objective of this study was to evaluate the functional independence evolution of patients included under home care, through the caregiver's point of view of the Functional Independence Measure (FIM) instrument, at two moments, with one year between them. A follow up study was designed. The data had been gotten in recorded case histories of 22 patients, who contained the evaluation of FIM at the two studied moments (October 2003 and October 2004). The recorded of the patients who presented changes of caregiver between the evaluations, exclusion of the program and death were excluded. Simple descriptive analyses were made and statistical differences were tested using Paired- T Test and Wilcoxon test. The association of the results of the MIF with gender, age and diseases of the patients had been analyzed by means of Paired- T Test and correlation of Pearson. The features of the sample were composed by a feminine majority, with advanced age and multiple associated illnesses. Statistically significant differences were not found between the evaluations by the perception of the caregiver, in the averages of the motor, cognitive and total FIM, of the medium of six dimensions and eighteen categories of the FIM. The maintenance in the expression activity was associated with the feminine sort, while that the social interaction activity and the cognition area correlated with the number of diseases. Maintenance of the functional capacity of the patients in the studied period was observed. The results suggest that the home care attendance was revealed as a capable modality to keep or to delay the functional decline from elderly.

KEYWORDS

aging health, frail elderly, homebound patients, home care services, functional independence measure.

Received on 21st December 2005 , accepted on March 31, 2006.

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Introduction

As the world's elderly population grows, the prevalence of non-transmissible chronic diseases increases and consequently, the development of disabilities associated to the aging process, with a great impact on public health, being this issue a matter of great concern. The improvement, or, at least the maintenance of the elderly functional capacity has been one of the most important and challenging objectives in Gerontology^{1,2,3}.

According to the World Health Organization⁴, functional disability refers to the "restriction of activities due to a deficiency, regarding the individual's performance and functional activity", and for Rosa *et al.*³, it is the "presence of difficulties in performing certain gestures and activities of daily life or even the incapacity of performing them".

Hence, in order to verify which assistance demand is the most adequate for the elderly individual, it seems more appropriate to assess the level to which the diseases prevent the performance, autonomically and independently, of every day activities by elderly patients⁵.

Among the types of health assistance available to the elderly population that exhibits some degree of dependence, homecare has been the subject of increasing discussions, regarding its importance. The current trend, in many countries and in Brazil, is to indicate that disabled elderly individuals should be kept in their homes under the care of family members, due to several reasons, such as hospital and institutional care cost reduction⁶.

Landi *et al.*⁸ evaluated 95 patients under home care services and found that they presented moderate to severe disability for activities of daily living (ADL), assessed by Barthel Index (score of 40.4) and for instrumental activities of daily living (IADL) assessed by Lawton's Scale (score of 24.8).

In studies carried out with institutionalized elderly individuals^{9,10} total FIM mean values were high, disclosing the presence of functional independence for most patients assessed. Cordeiro *et al.*¹² verified, in a group of institutionalized elderly women, that most of them (84%) presented modified/complete independence at FIM. Considering that, the elderly individuals under home care services presented more limitations and functional incapacity when compared to those committed to long-term health care facilities and even the hospitalized ones.

Home care services are inserted into a gerontological model of health services that aim, as much as possible, at preserving the most of the autonomy and functional independence of the elderly individual⁷.

In home care, the knowledge of the elderly individual's performance in his or her ADL is extremely important, as it will direct health professionals and caregivers when monitoring the health care services provided¹³. Thus, the optimized care for frail elderly individuals depends on a comprehensive evaluation, and that requires the use of multidimensional instruments validated in literature⁸.

The Functional Independence Measurement (FIM) instrument aims at determining the degree of help needed by the patient to perform his or her ADL¹⁴, being important for planning the home

care. The FIM is broadly utilized and accepted as a measurement of functional evaluation in the US and worldwide¹⁵ and is part of the Uniform Data System for Medical Rehabilitation (UDSMR). Riberto *et al.*¹⁶ developed the Brazilian version of the FIM, which demonstrated good cultural equivalence and good reproducibility. In the study of FIM validation in Brazil¹⁷, the measurement showed to be able to identify patients with higher degrees of impairment severity by disclosing lower values of functional independence in these patients. The instrument also showed sensitivity regarding the functional gains developed during an outpatient based rehabilitation program, so the FIM can foresee the outcome of an intervention¹⁷. In addition, it presents psychometric properties that are favorable to its use in the functional assessment of elderly individuals¹⁸.

Studies on the evolution of the functional picture of patients under home care programs are scarce and studies on the assessment of the functional independence of elderly patients under home care measured by FIM are not available, in the national as well as in the international scientific literature.

Objective

The present study aims at evaluating, from the point of view of the caregiver registered in the patient's file, the evolution of the functional independence of elderly individuals under home care, through the use of the Functional Independence Measurement (FIM) instrument, at two moments, with a 1-year interval between them.

Method

This is an analytical, longitudinal study, carried out at the "Programa de Assistência Domiciliária ao Idoso" (PADI - Elderly Home Care Program), which is connected to the Discipline of Geriatrics and Gerontology of the Federal University of Sao Paulo - Escola Paulista de Medicina. The study was approved by the Research Ethics Committee of our institution (process #01432/05).

The PADI aims at providing care for patients who do not have the clinical and/or social resources to systematically attend outpatient-based health treatment programs. The intervention is based on directions given to the caregiver and/or patient by the multidisciplinary team, which consists of a physician, a nurse, a physical therapist, a speech therapist, a dentist, a nutritionist and a social worker.

The patients are comprehensively assessed once a year to control the clinical evolution, and among the aspects analyzed, the functional capacity is assessed through the use of the FIM, as this is a measurement that fulfills the criteria of reliability, validity, precision, practicality and simplicity¹⁹. The assessment data are recorded in a specific form, kept alongside the patient's file.

The application of the FIM is carried out in the patient's home by a PADI professional through interviews with the caregiver, and the latter reports what the patient effectively accomplishes in his or her daily living activities. By using the caregiver's point of view it is possible to reduce the time of assessment and the inconsistency

of data when the patient presents cognitive alterations. In a study by Ricci *et al.*²⁰, the subjective measurement acquired through the caregiver's perception was concordant with the objective measurement.

The FIM is an instrument that evaluates 18 tasks that are scored from 1 (total dependence) to 7 (total independence), so its total score can vary from 18 to 126 points, and thus, the lower the score, the higher is the degree of dependence. The tasks are grouped in six areas of activities, as follows: self-care, sphincter control, transferences, locomotion, communication and social cognition^{14,17}. Two subscales of the FIM are described, the motor and the social-cognitive one. Rigolin¹¹ proposed that the FIM can also be classified according to its subscores, which vary from complete dependence with assistance needed for 100% of the task, modified dependence with assistance needed for 50% or more of the task, modified dependence with assistance needed for 25% to 50% of the task, and modified or complete independence with assistance needed for less than 25% of the task.

The data used for the present study were collected from the files of patients seen from October 2003 to October 2004, containing the sociodemographic characteristics of both caregivers and elderly patients and the clinical characteristics of the latter, as well as the FIM results.

The sample consisted of the files of the elderly patients attending the program, which contained two FIM evaluations with a 1-year interval between them (Evaluation 1 in October 2003 and Evaluation 2 in October 2004). Files of patients who presented change of caregiver between the evaluations, those who were eliminated from the program and the ones who died were excluded. Information provided by different caregivers was not considered, in order to reduce the bias of different perceptions regarding the same patient. As for the statistical analysis, descriptive analysis of the sociodemographic and clinical data were initially performed. The non-parametric Wilcoxon's test, which compares dependent samples through data medians, was used for the comparative analysis of tasks and FIM areas that referred to EVALUATION 1 and EVALUATION 2 due to the absence of normal distribution at the Shapiro-Wilks normality test. For the analysis of the global FIM, motor FIM and social-cognitive FIM, the paired T-test was used, which compares dependent samples through the means of the data, due to the occurrence of a normal distribution at the Shapiro-Wilks normality test. To verify if the results of improvement, worsening or maintenance of the FIM variables throughout a year were related to the elderly individuals' gender, age and comorbidities, the analysis of associations was performed from the difference between the results of EVALUATION 1 and EVALUATION 2 in each one of the tasks, areas, subscales and total FIM. The categorical variable gender was analyzed by Student's t test for samples that were related and the quantitative variables age and comorbidities, by Pearson's linear correlation coefficient. The significance level was set at 5% ($\alpha = 0.05$).

Results

In October 2003 (EVALUATION 1) 40 elderly individuals were

attending PADI and after a one-year follow-up (EVALUATION 2), 22 of them (55.0%) were enrolled in the study. The sample losses were due to 9 deaths, six changes of caregiver and three cases that were excluded from the Program.

The 22 caregivers who provided the information on the patients regarding the FIM were mostly females (95.5%), with mean age of 56.86 (± 16.65) years. The age range of 40 to 59 years was the most frequent one (45.5%). The informal caregivers represented 63.6%, and of those, 53.4% of the home care was provided by daughters (Table 1).

Table 1
Absolute and relative frequencies of sociodemographic and clinical data of the 22 caregivers of elderly individuals in homecare.

	Categories	Absolute	Relative
		Frequency (n)	Frequency (%)
Gender	Male	1	4,5
	Female	21	95,5
Age range	20- 39 yrs	4	18,2
	40- 59 yrs	10	45,5
	60- 79 yrs	6	27,3
	80 yrs or older	2	9,0
Civil status	With married life	10	45,5
	Without married life	12	55,5
Educational level	Illiterate	3	13,6
	Incomplete Grade School	10	45,5
	Complete Grade School	8	36,4
	High School or higher	1	4,5
Caregiver	Formal	8	36,4
	Informal	14	63,6

The 22 patients that remained in PADI during the one-year period of the present study were represented by a majority of female individuals (72.7%), with mean age of 82.64 (± 5.24) years; the minimum and maximum ages were 75 and 93 years, respectively. More than half of the patients were widowed (59.1%) and the remaining were married (22.7%) or single (18.2%). The elderly individuals presented on average 6 associated comorbidities (± 1.77 diseases), with the majority (95.5%) presenting neuropsychiatric diseases (Table 2).

Considering the classification of the total FIM subscores, proposed by Rigolin¹⁶, 50.0% of the individuals in the sample (n=11), presented modified dependence – assistance needed for up to 50% in the first evaluation as well as in the re-evaluation (Table 2).

The mean values of motor, social-cognitive and total FIM shown in Table 2 showed a score decrease at EVALUATION 2 when compared to EVALUATION 1; however, these differences were not statistically significant (Table 3).

The median values of the self-care and social cognition areas showed a score increase at EVALUATION 2 when compared to EVALUATION 1. The six areas of activities that comprise the FIM did not show statistically significant differences between the evaluations (Table 4).

Table 2
Absolute and relative frequencies of sociodemographic and clinical data of the 22 elderly individuals in homecare.

	Categories	Absolute	Relative
		Frequency (n)	Frequency (%)
Gender	Male	6	27,3
	Female	16	72,7
Age range	75-79 yrs	6	27,3
	80 – 90 yrs	13	59,0
	90 yrs and older	3	13,7
Civil status	Single	4	18,2
	Married	5	22,7
	Widowed	13	59,1
Educational level	Illiterate	4	18,2
	Incomplete Grade School	10	45,5
	Complete Grade School	6	27,2
	High School or higher	2	9,1
Neuropsychiatry disorders	Present	21	95,5
	Absent	1	4,5
Cardiovascular disorders	Present	17	77,3
	Absent	5	22,7
Musculoskeletal disorders	Present	18	81,8
	Absent	4	18,2
Endocrine-metabolic disorders	Present	9	40,9
	Absent	13	59,1

Table 3
Classification of the dependence level of elderly patients by FIM sub-scores at evaluations 1 and 2 according to Rigolin¹¹.

	Score Variation			Frequencies (n)	
	(Minimum and Maximum Values)			Evaluation 1	Evaluation 2
Total dependence - 100%total assistance	Possible	Evaluation 1	Evaluation 2	Evaluation 1	Evaluation 2
	18	18	18	18	18
Modified dependence - up to 50% assistance	19 - 60	20 - 57	21-60	20 - 57	21-60
	61 - 103	71 - 92	65 - 91	71 - 92	65 - 91
Modified dependence - up to 25% assistance	104 - 126	105 - 111	108 - 120	105 - 111	108 - 120
	104 - 126	105 - 111	108 - 120	105 - 111	108 - 120

Among the tasks evaluated, feeding, morning hygiene, social interaction and memory presented the highest median values at EVALUATION 2. None of the FIM tasks presented statistically significant differences between the two evaluations, with the exception of the “stairs” task, which showed a trend to significance

Table 4
Mean and SD values of Motor, Social-cognitive and Total FIM at Evaluations 1 and 2, followed by Paired T-test.

	Score Variation			Means and SD values		Paired T test*
	(Minimum and maximum values)			Evaluation 1	Evaluation 2	
Motor FIM	Possible	Evaluation 1	Evaluation 2	Evaluation 1	Evaluation 2	p-value
	13 - 91	13 - 81	13 - 89	40,27 ± 21,86	38,59 ± 22,23	0,602
Social-cognitive FIM	5 - 35	5 - 35	5 - 32	19,32 ± 10,48	18,64 ± 9,37	0,600
Total FIM	18 - 126	18 - 111	18 - 120	59,68 ± 30,65	57,77 ± 31,01	0,633

* level of significance $\alpha \leq 0,05$.

Table 5
Median values of FIM areas at evaluations 1 and 2, followed by Wilcoxon's test..

	Score variation			Medians		Wilcoxon's Test *
	(Minimum and Maximum Values)			Evaluation 1	Evaluation 2	
Self-care	Possible	Evaluation 1	Evaluation 2	Evaluation 1	Evaluation 2	p - value
	6 - 42	6-39	6-42	15,00	15,00	0,639
Sphincter control	2 - 14	2-12	2-14	6,00	6,00	0,593
Transferences	3 - 21	3-19	3-20	8,50	8,50	0,567
Locomotion	2 - 14	2-12	2-12	5,00	5,00	0,499
Communication	2 - 14	2-14	2-14	9,00	9,00	0,703
Social Cognition	3 - 21	3-21	3-20	9,50	9,50	1,000

* significance level: $\alpha \leq 0,05$.

($p=0.079$), as shown in Table 4. This difference in the worsening of the “stairs” task can be explained by the higher frequency of score 1 (total dependence) at EVALUATION 2 (72.7% of the patients) in comparison to EVALUATION 1 (54.5% of the patients - Table 5).

Regarding the correlation between the FIM results after the 1-year program with gender, age and comorbidities of the elderly individuals, no statistical significant difference was observed between age and the FIM variables. The maintenance of the functionality in the expression task showed a significant association with the female gender and the social interaction task and the social-cognitive area had a significant correlation with the higher number of comorbidities (Table 6). The other tasks, areas, subscales and total FIM did not present significance in the maintenance of the picture regarding the sociodemographic and clinical variables tested.

Discussion

The data regarding the sociodemographic characteristics of PADI caregivers are compatible to those in the literature^{22,6}, which show that the act of caring has a female profile, being almost always restricted to one of the nuclear family members, i.e., the one in charge of caring for the elderly is usually an informal caregiver.

The mean age and comorbidities of the elderly patients enrolled in a home care service program are usually higher when compared to the ones from the community or those in rehabilitation centers, probably due to the fact that this population presents a more impaired functional status, necessary for its eligibility in this type of

Table 6
Median values of FIM activities at evaluations 1 and 2, followed by Wilcoxon's test.

	Score Variation		Medians		Wilcoxon's
	(Minimum and Maximum Values)				Test *
	Evaluation 1	Evaluation 2	Evaluation 1	Evaluation 2	p- value
Feeding	1-7	1-7	4,00	4,50	0,589
Morning hygiene	1-7	1-7	2,50	3,00	0,296
Shower/bath	1-6	1-7	2,00	2,00	0,830
Dress above the waist	1-7	1-7	3,00	2,00	0,572
Dress below the waist	1-7	1-7	2,00	2,00	0,755
Use of the toilet	1-7	1-7	2,00	1,50	0,718
Urine control	1-6	1-7	2,50	2,00	0,748
Stool control	1-7	1-7	4,00	2,00	0,374
Transference: bed, chair, wheelchair	1-7	1-7	3,00	2,00	0,716
Transference: toilet	1-7	1-7	3,00	2,00	0,688
Transference: bath or shower	1-6	1-6	3,00	2,00	0,754
Locomotion	1-7	1-7	3,00	2,00	0,877
Stairs	1-7	1-6	1,00	1,00	0,079
Comprehension	1-7	1-7	5,00	5,00	0,438
Expression	1-7	1-7	3,00	3,00	0,724
Social Interaction	1-7	1-7	3,00	5,00	0,607
Problem solving	1-7	1-7	2,00	2,00	0,439
Memory	1-7	1-7	3,00	4,00	0,749

* significance level: $\alpha \leq 0.05$.

assistance.

Ramos *et al.*²³ observed that the mean age of the elderly residing in a metropolitan area of southern Brazil was 69 years, with only 10% of this population being 80 years or older. This mean age augments when the elderly patients restricted to the home environment are considered, which is the case of the present study sample whose mean age was 82.64±5.24 years, with 63.6% of the patients being 80 years or older, similar to other programs in which the percentage of elderly individuals older than 80 years was 40.8%²⁴ and 31.0%²⁵.

Thus, as in the other studies that involve an elderly population under home care^{24,25,8}, most of the patients (72.7%) enrolled in the home care service program are females. As the present study sample consists of older individuals who are mostly females, who usually have a longer life expectancy, these factors probably influenced the higher occurrence of widowhood, different from studies with elderly individuals from the community, in which most are married (51.0%)²⁶.

Two large projects with elderly individuals carried out in the city of São Paulo^{23,5} showed that the ADL impairment is, on the one hand, associated to aging, and on the other hand, to a matter of gender, especially the female one. These two factors are massively present in our sample, which reinforces their correlation with functional dependence.

Table 7
FIM activities and areas, whose maintenance presents a significant correlation with type and comorbidity of elderly patients under homecare.

	Activities and Areas	Test	p- value
Type	Expression	T Test	0,036
Comorbidities	Social interaction	Pearson's Correlation	0,008
	Cognition		0,023

* significance level: $\alpha \leq 0.05$.

Landi *et al.*⁸ used the Minimum Data Set for Home Care (MDS-HC) instrument, which is specific for the assessment of patients under home care, and observed that more than one-third presented severe ADL incapacity. These data corroborate the findings of the present study, in which 59.0% (13 elderly patients) of the assessed individuals needed assistance for up to 50% of the tasks.

At PADI the interventions are based on the caregivers' directions, with exception of the medical intervention, which is direct; thus, the efficacy of program depends on the caregiver's collaboration. During the one-year period there were no statistically significant changes in any of the activities, areas, cognitive FIM, motor FIM and total FIM, pointing to a maintenance of the patients' functional picture. However, a trend to significance was observed in the increase of the number of patients who needed total help in the activity Stairs of the FIM. To go up and down the stairs is a task of dynamic balance associated to specific functions of strength and gait of the lower limbs, which require good postural control, a condition that is frequently impaired among elderly patients under home care.

The limitations of the present study are the small sample size and the lack of control over the effective directions by caregivers and patients proposed by the team; therefore, this was not considered to be a quasi-experimental study design. The majority of the studies that used the FIM to assess elderly patients were carried out in rehabilitation units and hospitals¹⁸. Considering the scarcity of literature in this area, it is important to introduce preliminary data on the home care programs for elderly patients, which are on the rise in Brazil.

It is important to emphasize that, in the case of these elderly individuals who were previously dependent, of advanced ages, present several associated comorbidities and receive indirect intervention, the functional maintenance represents a good indicative in preventing the functional decline and total dependence. As most of the FIM variables did not show to be associated with age, gender and number of comorbidities of the enrolled elderly individuals, it is possible that the clinical picture of the elderly patient can remain stable for long periods, as long as no acute event occurs.

The FIM variables that had their maintenance associated to gender and number of comorbidities are related to cognition, which indicates that, in fact, the cognitive impairment leads to a functional decline with the aging process and the presence of multiple illnesses; however, these patients benefit from the interventions¹⁸, which could have led to the delay of losses in the studied population. Age alone was not a determinant variable in the FIM results between the

groups of elderly patients who had a stroke or who suffered a hip fracture²⁷, but similarly to the present study, factors associated to advanced age such as the increase of comorbidities can influence the results of the interventions on elderly patients.

Kawasaki and Diogo¹⁰ studied the impact of hospitalization on the functional independence of the clinically treated elderly individual and observed that all elderly individuals evaluated in the home environment presented higher FIM scores when compared to the moment of hospital discharge. This information indicates that the home environment is favorable to the improvement of functionality.

When the aforementioned factors are considered, perhaps the improvement cannot be regarded as being substantial, but the possibility of maintaining these elderly patients in their home and family environments, even when the incapacities are taken into account, shows that the modality of home care assistance must be considered, as it enables elderly individuals to maintain their family ties, preventing their isolation and the physical and mental inactivity, consequently having a positive impact on their quality of life²⁸.

Conclusions

During the one-year follow-up, the evolution of the functional capacity of elderly patients under home care assistance did not show statistically significant difference between the FIM evaluations from the caregivers' point of view, demonstrating the maintenance of the functional picture of these patients within the study period. The results suggest that, although the sample was small and consisted of individuals of advanced ages and with multiple associated comorbidities, the elderly patients under home care are capable of maintaining their functional level or even delay its decline, for a one-year period.

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