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Functional independence of the elderly in multiprofessional home care

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ABSTRACT. Functional evaluation is one of the pillars of elderly home care for planning of interventions targeting the autonomy of this population. To verify Functional Independence Measure (FIM) in senior patients on a home care program. Retrospective quantitative study with elderly patients assisted by a home care service in the city of Curitiba, from August 2012 to December 2016. The following information was collected: gender, age, clinical diagnosis, and mean FIM scores at admission and discharge. Inclusion and exclusion criteria were met, descriptive statistics was used and, for association of variables, Wilcoxon's and Spearman's tests were applied. 1,614 patients were included, with predominance of women (n = 953; 59.53%), mean age of 78.7 ± 9.2 years, clinical diagnoses of diseases mostly affecting the central nervous system (CNS), the respiratory system, the joint and musculoskeletal system, and the circulatory system. The initial mean FIM was 50.56 points, while the final one was 55.36 points, with significant difference – Z = -5.09, p = 0.0001. Most seniors presented maximum to moderate dependence; however, a significant improvement in FIM after the health care provided in their homes was observed in patients with minimum dependence or modified independence.

Keywords: home care services; health care services; comprehensive elderly care; the elderly.

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Introduction

The Brazilian population is aging rapidly. Data from the 2015 National Household Sample Survey revealed a figure of 29,374,000 senior individuals, which accounts for 14.3% of the overall population and is a greater proportion than that observed in 2010, when the rate was at 11.7%, and this process often unfolds without proper assistance for a healthy aging (Gratão et al., 2013; Macêdo, Cerchiari, Alvarenga, Faccenda, & Oliveira, 2012; *Instituto Brasileiro de Geografia e Estatística* [IBGE], 2015; United Nations, 2015).

Despite Public Policies developed in an attempt to ensure comprehensive elderly care, such as The Elderly Statute (Brasil, 2016) and, later, the National Policy for Elderly Health Care [*Política Nacional de Saúde da Pessoa Idosa*] (PNSPI), the literature has few reports aiming to quantify factors that hinder an active and healthy aging process and that evaluates the elderly's functional impairment.

Functional impairment increases significantly with aging, depression, cognitive impairment, number of chronic-degenerative diseases, and hospital admission (Brasil, 2003). Several instruments can be used in gerontologic practice, such as Functional Independence Measure (FIM), for instance, which comprehends motor, cognitive and social domains that are relevant in overall functionality evaluation (Riberto, Miyazaki, Filho, Sakamoto, & Batisttella, 2001; Barbetta & Assis, 2008; Hajek & König, 2016).

A literature review study on instruments that assess senior citizens' functional status revealed that FIM was used in 285 researches, being the second most frequently used instrument. It is of wide utilization in evaluations and can also be applied to follow up patient performance and inserted in an elderly home care program, for being easy to handle and having a good relationship with daily life activities (Paixão & Reichenhem, 2005).

Thus, with the understanding that there are few studies with seniors inserted in home care programs and that an elderly individual's functionality needs to be observed and stimulated for successful aging, the objective of this study was to verify Functional Independence Measure (FIM) variations in senior patients assisted by a home care program.

Material and methods

This is a retrospective and quantitative study conducted from data contained in medical records of patients assisted by a home care service provided by the Brazilian Unified Health System [*Sistema Único de Saúde*] (SUS) called Better at Home Program, in the city of Curitiba, from August 2012 to December 2016. The research was approved by the ethics committee on Research Involving Humans of Curitiba's Municipal Health Secretariat, Paraná, Brazil, and was given favorable legal opinion, under registration CAAE 49423014.7.0000.5223.

The study inclusion criteria were: patients aged 60 or over, admission by the home care service in Curitiba, and undergoing functional evaluation at the beginning (initial FIM) and at the end (final FIM) of the program follow-up. For being a research on functionality in the elderly, the exclusion criteria were: patients aged below 60, those who had no initial or final FIM records collected, incomplete or questionable data in the records, and cases of death during the program follow-up.

It is worth noting that the inclusion of patients in the Better at Home Program has the following criteria: residing in Curitiba, being registered in the Brazilian Unified Health System, having a responsible companion at home, presenting pathologies that justify difficulty of access to Basic Health Units, clinical stability, homes with proper hygiene and structure conditions for use of life support equipment, and being referred by a unit from Curitiba's Health Care Network.

Data were collected by the service physiotherapists according to the medical records of the Program. For this study, the following information were considered: gender, age, clinical diagnoses, and initial and final FIM scores for the last multiprofessional service. The collected clinical diagnosis will consider the main ICD attributed to the patient by the doctor.

FIM is composed of a set of 18 competences, namely: self-care, transfers, locomotion, sphincter control, communication and social cognition, which includes memory, social interaction and problem solving. Each one of these evaluated activities is scored, from 1 (total dependence) to 7 (total independence). Thus, total score ranges from 18 to 126 points, and the higher the score the greater the individual's independence level (Hajek & König, 2016). Strata vary according to functional limitation; a minimum score of 18 points corresponds to total dependence, 19-60 represents maximum/moderate dependence, 61-103 means minimal dependence and supervision, and 194-126 corresponds to modified or total independence (Okuno, Miyasaka, & Dobashi, 2012).

Data analysis used statistical analysis software SPSS 22 for Windows. For correlation between age and the functional independence measure test values, Spearman's test (*rs*) was used, and for comparison between initial and final means, Wilcoxon's non-parametric measures test (*Z*) was applied. Data with $p \leqslant 0.05$ were deemed significant.

Results

The Better at Home Program followed up 12,123 patients assisted by it, of which 1,614 were included in the research for meeting the inclusion criteria; 59.23% of them (n = 956) were females and (n = 658) 40.76% were males (Figure 1), with a mean age of 78.7 ± 9.2 years (80 ± 9.47 years for women, and 77 ± 8.23 for men.

Table 1 displays the main systems affected by diseases described in the medical records. There was a prevalence of diseases associated with the nervous system (45.47%), and this group included Cerebrovascular Accident (CVA), dementia, Parkinson's disease and demyelinating diseases. Records of signs and symptoms or diseases under investigation without definitive clinical diagnosis were grouped as 'Unspecific'.

Table 2 showed a mean FIM reduction of 9.2% in the elderly categorized as having total dependence, and 7.2% in those with maximum/moderate dependence. In contrast, there was an increase in FIM means of 4.7% in the elderly with minimal dependence and supervision, and 32.6% in those with modified/total independence (Table 2).

Table 3 presents FIM means in the initial and final moments by gender, and it is possible to observe that all results were classified as maximum/moderate dependence. Comparing initial and final means from the medical records included in the study, difference was found between them, with Z = -5.09, p = 0.0001.

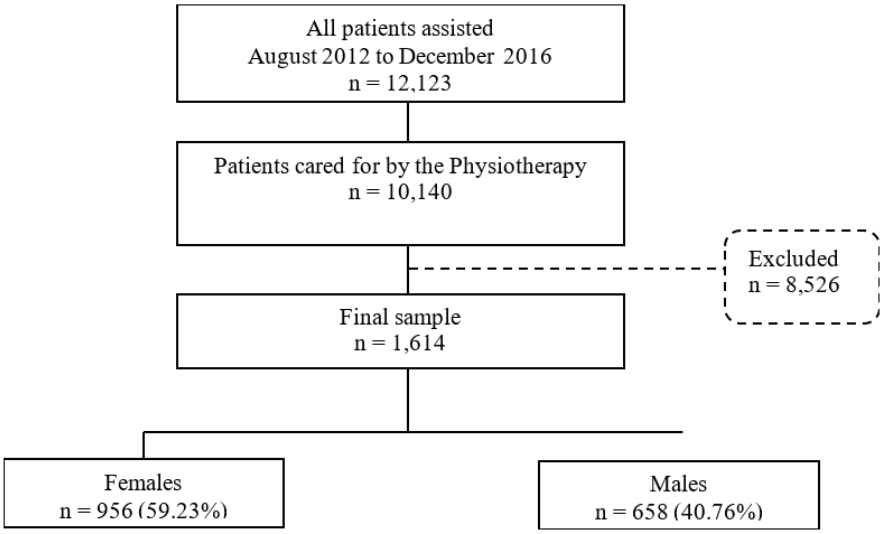

Figure 1. Sample selection flowchart.

Table 1. Main systems affected according to the patient's disease.

Gender	Female		Male		Total	
	n = 956	%	n = 658	%	n = 1614	%
Nervous system diseases	403	24.97	330	20.44	734	45.47
Respiratory system diseases	114	7.06	64	3.96	178	11.02
Joint and musculoskeletal diseases	79	4.89	75	4.64	154	9.53
Circulatory system diseases	73	4.52	35	2.16	108	6.68
Oncologic diseases	38	2.35	37	2.29	75	4.64
Endocrine diseases	19	1.18	9	0.55	28	1.73
Urinary tract diseases	12	0.74	15	0.92	27	1.66
Hematologic disease	0	0	1	0.06	1	0.06
Gastrointestinal diseases	3	0.19	4	0.24	7	0.43
Mental disorders	3	0.19	0	0	3	0.19
Unspecific	177	10.97	60	3.71	391	14.68
Others	35	2.17	28	1.7	63	3.87

Table 2. Distribution of number of patients according to dependence categorization as to initial and final FIM.

Classification	Initial FIM (%)	Final FIM (%)
1 – Total dependence	499 (30.92)	453 (28.7)
2- Maximum/moderate dependence	559 (34.63)	519 (32.16)
3- Minimum dependence/supervision	341 (21.13)	357 (22.12)
4- Modified/total independence	215 (13.32)	285 (17.66)

Table 3. Initial and final FIM means.

FIM	Total: 1,643	Females 967 (59,3%)	Males 664 (40,7%)
Initial FIM	50.1 (±35.5)	50.7 (±35.7)	51.6 (±35.1)
Final FIM	55.6 (±38.1)	55.7 (±38.5)	55.5 (±36.4)

Discussion

The sample comprises an elderly population composed predominantly of women (59.53%), with a mean age of 78.7 ± 9.2 years. Other studies have shown predominance of women as well, a fact that may be linked to lower exposure to risk factors related to their workplace, lower prevalence of tobacco smoking and alcohol consumption, and more frequent use of health systems (Pilger, Menon, & Mathias, 2011; Fhon et al., 2012; Dantas, Bello, Barreto, & Lima, 2013; Cheng, Yang, Cheng, Chen, & Wang, 2014; Lima, Araújo, & Scattolin, 2016).

In this study, the main clinical comorbidities were linked to diseases affecting the CNS (45.47%), the respiratory system (11.02%), and the joint and musculoskeletal system (9.53%). Similar data on prevalence of CNS diseases are found in studies with seniors residing at long-stay institutions (Dantas et al., 2013). It is suggested that CNS diseases lead to greater functional impairment, requiring other people for supervision

or physical help so that certain activities can be performed (Macêdo et al., 2012; Rosa, Moraes, & Santos Filha, 2016).

The incidence of unspecific pathologies is worth attention. It is important to highlight that this classification grouped rare diseases, unspecific symptoms registered on consulted medical records, multiple sequelae, and others. This high index can be explained, since the elderly present multiple morbidities, which, in their turn, lead to a greater risk of complications and may increase health care needs (Medijainen, Pääsuke, Lukmann, & Taba, 2015). The majority of this study sample suffered an acute health-related event and required hospital admission. Thus, a certain degree of functionality basal impairment is to be expected. Some authors report that a senior's functionality oscillates after hospitalization, due to acute and chronic events, or even elective surgeries. This functional drop during or right after hospital admission becomes more serious over the hospitalization period; nevertheless, it was possible to observe improvements in FIM results, comparing initial and final FIM values, and a reduction in the number of people with final FIM values indicating total dependence (Cameron et al., 2012; Tomlinson et al., 2012; Nunes et al., 2017).

The results of this study show high levels of functional dependence. Similar data were found in the elderly assisted by a health care center in Talca, Chile, with mean total FIM of 55.4±28.6 (Calero-García, Calero, Navarro, Ortega, & Campos, 2016). These data differ from those of other studies, which show means of 121.6 points for institutionalized senior patients, and 69.35 for elderly individuals who went home after fractures, which may reinforce the fact that hospitalization reduces the elderly's functionality significantly (Silva, Rojas, & Marzuca-Nassr, 2015; Josino, Costa, Vasconcelos, Domiciano, & Brasileiro, 2015).

Another study conducted with 574 seniors from Ribeirão Preto, in Brazil, presented mean FIM of 113.9 (±20.6), and 15.7% of the elderly were identified as dependent, by correlating functionality with caregivers' overload (Gratão et al., 2013). These values can show that the senior members of that community were actively capable of keeping good functionality indexes.

A study was conducted with 560 Australian seniors; the sample was mostly composed of individuals with orthopedic issues (hip fracture, joint replacement, lower limb amputation, etc.) and CVA, and FIM scores increased during hospitalization for rehabilitation, with an overall increase mean of 6.7 points per week. This fact values a therapeutic process focused on functional rehabilitation, even in a hospital environment.

In contrast, a study conducted at seven rehabilitation centers in Finland with 741 senior patients, of which 376 were in the intervention group, and 365 in the control group, observed a drop of 3.41 points in FIM for the intervention group, and 4.35 points for the control group (Silva, Ximenes, Silva Junior, Ísola, & Rezende, 2009). Such a fact may suggest that intervention and evaluation programs need to be carried out with the elderly for functional improvement, but there is still need for knowing all factors that influence the aging process and functional enhancement of this age group.

It is worth highlighting that equipping families with health education is a tool that encourages self-care, besides habit or behavioral changes, thus contributing to introducing a new attitude towards care, which can be a means to improve the elderly's functionality (Kehusmaa, Autti-Rämö, Valaste, & Rissanen, 2010).

As for initial and final FIM, a strong correlation was found for one end, assuming that the final FIM would be better than the initial one. This difference can be explained by interventions performed during the program services provided by home care multiprofessional teams. In this sense, referring specifically to the work carried out by the team's physiotherapist, the predominant procedures that contributed to improving functionality were: passive or active kinesiotherapy, sedestation and orthostatism, gait training and evolution, in addition to cardiorespiratory conducts depending on the case.

The generated results also showed that the scores increased in most patients, since they presented greater functional independence. This phenomenon can be explained by the fact that independent patients have greater motor and cognitive skills to replicate requested exercises and conducts, thus tending to increase their functional capacity throughout the treatment. In contrast, when it comes to dependent patients, there are smaller signs of recovery oftentimes because these individuals already have other associated impairments, such as deformities as well as motor and cognitive incapacity.

Conclusion

There was predominance of women and CNS-related clinical issues in home care, with higher occurrence of maximum to moderate dependence, in addition to improved FIM in modified

independence and minimum dependence categories after the health assistance provided by the multiprofessional team.

Further studies should be conducted in order to describe intervention and evaluation programs developed by home care programs for the elderly.

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