

Prevalence of mobility impairment in institutionalized elderly

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ABSTRACT

Objective: To identify the prevalence of mobility impairment in institutionalized elderly people and its correlation with the clinical and functional conditions, a cross-sectional study was carried out with 191 people aged ≥ 60 years residing in 13 long-stay institutions for the elderly in Passo Fundo, year of 2014. **Method:** A structured questionnaire was used, applied to the elderly or to the technical managers of the institutions. Sociodemographic variables related to health and specific questions about walking difficulties were considered. It was considered mobility impairment the need of any help or aid to walk, be it a cane, a walker or even restriction to bed. A descriptive and bivariate analysis of the data was performed. To verify the association between the categorical variables Pearson's chi-square test and Fisher's exact test were applied at a significance level of 5%. **Results:** The prevalence of mobility impairment was 50.3%. They used wheelchairs 41.7%, walkers 16.7%, canes 14.6% and crutches 3.1% and were bedridden 24%. Of the elderly with mobility impairment, 89.6% were dependent to perform daily living basic activities and 62.5% considered their health as fair, poor or very poor. **Conclusion:** The high prevalence of mobility impairment, including many bedridden elderly people, highlights the need for preventive interventions before institutionalization and the minimization of the complications that these conditions can bring.

Keywords: Aged, Locomotion, Gait, Homes for the Elderly

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INTRODUCTION

Population aging is a global reality and Brazil experiences this process in an accelerated way. In this sense, the 2010 demographic census shows that the Brazilian population is approximately 190 million people, and the contingent of elderly people is about 20 million, or approximately 10.8% of the total population.¹

According to the World Health Organization,² chronologically, old age begins at the age of 65 in developed countries and in developing countries, such as Brazil, at the age of 60. Thus, considering that getting old is a phase of life inherent to the process of aging, and that more and more people are living in this phase, there is a need for a special and humane look at this population.

Large-scale growth of the elderly population occurs under unfavorable socioeconomic and cultural conditions. It is observed that these elderly people are in physical-functional vulnerability and chronic degenerative processes that may predispose to referral to long-term institutions.³ The institutionalization is surrounded by several factors, among which we highlight the advanced age, phase in which several diseases and disorders related to old age may arise, such as gait and mobility disorders.

Walking is a routine task and a fundamental part of daily life activities. Basically, it is defined as the way or style that the individual walks.⁴ Good gait performance depends on the integral functioning of various organs, especially those that make up the neurological, musculoskeletal, and cardiovascular system.⁴

OBJECTIVE

In view of the above, the objective was to identify the prevalence of mobility impairment in institutionalized elderly in Passo Fundo/RS and to verify the association with the clinical-functional profile.

METHODS

A cross-sectional study was carried out with 191 individuals aged 60 years or older residing in the long-stay institutions for elderly people (ILPIs – *Instituições de Longa Permanência para Idosos*) of Passo Fundo, in the year of 2014. Part of this paper was taken of a dissertation research entitled “Factors associated with the institutionalization of Elderly: a population-based case-control study”.

Nowadays, Passo Fundo has 16 ILPIs, which are home to 363 elderly people, according to data from the Senior Citizens’ Desk (The counter is a space for receiving requests regarding situations of risk and social vulnerability, a partnership between the Public Prosecutor’s Office, Passo Fundo Town Hall and the University of Passo Fundo). They are divided into private for-profit and non-profit institutions. The number of residents changes frequently due to transfers and deaths. The ability to receive these elderly people also varies, depending on the availability of accommodation and structure.

For the sample calculation, the acceptable error was 0.05. They were added (10%) to the total to compensate for possible losses (ineligible, refusals, etc.) which resulted in a total of 205 elderly. Between the period of survey of the elderly residents and collection of authorizations up to the moment of the interview, the following losses had occurred: six deaths, four rejections (did not agree to sign the informed consent form), two hospitalizations at the time of the interview, two residents aging less than 60 years. The sample totaled 191 elderly people distributed in 13 ILPIs who accepted to participate in the study.

The data were collected from a structured questionnaire, applied to the elderly. In cases where the elderly were not able to respond, due to cognitive complications or aphasia for example, the technical person responsible for the institution was requested. Sociodemographic variables (gender, age, skin color, marital status, schooling, income), health related (chronic diseases and dependence for basic activities of daily living), along with specific issues related to the difficulty of locomotion were contemplated. The Katz Index⁵ was attached to the questionnaire and it is an instrument that assesses independence for basic activities of daily living - such as bathing, dressing, going to the toilet, transfers from bed to chair and vice versa, control over the sphincters and unattended feeding.

From the assumption that locomotion is the “displacement of the individual from one place to another in a versatile way and with the lowest energy consumption possible”⁶ was considered difficulty of locomotion the need of any help or support for ambulation, be it flares, crutches, Walker (partial difficulty), wheelchair users or even restricted to the bed (total difficulty). Some bedridden had moments in wheelchair, nevertheless, those that actively realized the transfers were considered wheelchair users and those that could not sit upright in bed and transfer themselves to the chair were considered bedridden.

A descriptive and bivariate analysis of the data was performed. To verify the association between categorical variables, Pearson’s chi-square test and Fisher’s exact test were applied at a significance level of 5%.

The research project was approved by the Research Ethics Committee of the University of Passo Fundo, State of Rio de Janeiro, Brazil, for its opinion number 648.771 / 2014, and the elderly or their caretakers signed the informed consent form before the interview.

RESULTS

A total of 191 institutionalized elderly persons participated in the study, of which 69.1% were female. The mean age was 79 years (± 9.8), ranging from 60 to 115 years. As for income, 60.7% received up to one minimum wage and 91.6% were retired. There was a significant association between difficulty in locomotion and marital status, that is, the elderly living with their partner presented proportionally higher rates of difficulty in locomotion (Table 1).

The prevalence of mobility impairment was 50.3%. As for the gait aiding device, 41.7% used wheelchairs, 24.0% were bedridden (they had moments in the wheelchair but were unable to carry out the transfers), 16.7% used walkers, 14.6% canes and 3.1% crutches. Drug consumption was present in 97.4% of the interviewees (Table 2).

The diseases and complications presented were hypertension 44.2%, Alzheimer’s 26.3%, diabetes 16.3%, other unspecified dementias 13.7%, heart diseases 13.7%, cerebrovascular accident sequelae 13.7%, Arthritis/arthrosis/osteoporosis 10.5%, Parkinson’s disease 9.5%, circulatory diseases 8.4%, respiratory diseases 4.2% and cancer 3.2%. Alzheimer’s disease had a significant association with walking difficulties ($p = 0.002$) (Table 3).

Other diseases that could affect ambulation in some way were not statistically significant, such as Parkinson’s, other unspecified dementias, arthritis and arthrosis, etc. On the other hand, in the elderly with stroke, 24% ($n = 23$) had mobility impairment and only 3.2% ($n = 3$) presented no gait difficulties ($p < 0.001$) (Table 3).

Of the 96 elders with mobility impairment, 89.6% were dependent on other people to do the daily living basic activities ($p < 0.001$). Those with gait difficulties did not perform physical activities, 88.5% ($p < 0.001$) (Table 3).

In the consumption of medicines, mainly above 11 a day, there was a significant difference,

Table 1. Distribution of the elderly regarding sociodemographic variables and mobility impairment, Passo Fundo - RS, 2014

Variables	Mobility Impairment				Total		p
	Yes		No		n	%	
	n	%	n	%			
Gender							
Male	31	32.3	28	29.5	59	30.9	0.673
Female	65	67.7	67	70.5	132	69.1	
Age Group							
60-69 years	19	19.8	16	16.8	35	18.3	0.264
70-79 years	33	34.4	29	30.5	62	32.5	
80-89 years	27	28.1	39	41.1	66	34.6	
90 or more years	17	17.7	11	11.6	28	14.7	
Marital Status							
With a partner	81	86.2	90	94.7	171	90.5	0.045
Without a partner	13	13.8	5	5.3	18	9.5	
Education Level							
Illiterate	17	18.7	27	29.3	44	24.0	0.150
From 1 to 4 years	44	48.4	30	32.6	74	40.4	
From 5 to 8 anos	16	17.6	18	19.6	34	18.6	
9 or more	14	15.4	17	18.5	31	16.9	
Income							
Up to 1 minimum salary	48	57.1	54	64.3	102	60.7	0.455
From 1 to 3 minimum salaries	27	32.1	25	29.8	52	31.0	
Above 3 minimum salaries	9	10.7	5	6.0	14	8.3	
Retired							
Yes	86	89.6	89	93.7	175	91.6	0.306
No	10	10.4	6	6.3	16	8.4	

Table 2. Mobility impairment and medication consumption of the institutionalized elderly, Passo Fundo - RS, 2014

Variables	N	%
Mobility impairment		
Yes	96	50.3
No	95	49.7
Gait Aid		
Wheelchair users	40	41.7
Bedridden	23	24.0
Walker	16	16.7
Canes	14	14.6
Crutches	3	3.1
Drugs		
Yes	187	97.4
No	5	2.6

16.1% (n = 15) had mobility impairment and only 4.4% (n = 4) of the elderly with consumption above 11 medicines/day without assistance (p = 0.010) (Table 3).

62.5% of elderly people who had mobility impairment considered their health as regular, poor or very bad (p = 0.001) (Table 3).

DISCUSSION

The disparity between the sexes was quite significant, since 69.1% were female. According to data from the census,⁷ Brazil has about 23 million elderly, of these 55% are women, a process known as the feminization of old age.

Among the factors that explain this process, it is worth noting that women take better care of their health, conduct consultations and examinations periodically, have a healthy diet, do more physical activities and engage less in accidents. Also, a differential mortality by sex can be listed; drop in maternal mortality; hormonal protection of estrogen; different insertion in the labor market; different consumption of tobacco and alcohol; different posture in relation to health/illness; different relationship with health services.⁸

The non-existence of a partner was identified in 89.5% of the elderly. Solitary elderly, faced with complications requiring care, face challenges, especially regarding the provision of care. The changes in the social role of women, traditionally the family caregiver, is one of the difficulties in the provision of home care, since currently, women are inserted in the labor market, which reduces the full-time female presence in the household. These social phenomena have repercussions on a greater demand for long-term care.⁹

Low levels of schooling are seen in other studies. In the research developed by Alencar et al.¹⁰ it is observed that 25.5% of the institutionalized elderly are illiterate or with low educational level 59.6%. According to Rosa et al.¹¹ in the year 2000, 40% of the men and 48% of the elderly women in Brazil declared themselves illiterate.

In institutions, the highest age groups were prevalent. These data corroborate a study by Pelegrin et al.¹² with 75% of institutionalized elderly in the interval between 71 and 90 years. Ferreira and Yoshitome¹³ demonstrated that the majority of the institutionalized elderly are concentrated in the 80-85 age group.

The high prevalence of elderly people with some level of locomotion dependence identified in this study is similar to the study by Pelegrin et al.¹² with 72 elderly individuals from an institution in Ribeirão Preto - SP; the authors identified a rate of 55.5%. In a study conducted by Smanioto and Haddad¹⁴ with 204 institutionalized elderly, mobility impairment reached 46.1%. The authors grouped them into categories: 11.8% needed help from another person, walker or cane; 34.3% are wheelchair-bound or bedridden.

With aging problems arise in the joints, thus preventing stable mobility, as there is a wear and tear of the joints, the muscles are no longer stiff, there is loss of muscle strength hindering walking.⁴

In addition, some diseases cause difficulty in walking safely, for example: Parkinson's

Table 3. Distribution of the elderly regarding health and mobility impairment variables, Passo Fundo - RS, 2014

Variables	Mobility impairment				Total		p
	Yes		No		n	%	
	n	%	n	%	n	%	
Hypertension							
Yes	39	40,6	45	47,9	84	44,2	0,315
No	57	59,4	49	52,1	106	55,8	
Diabetes							
Yes	19	19,8	12	12,8	31	16,3	0,190
No	77	80,2	82	87,2	159	83,7	
Parkinson's disease							
Yes	9	9,4	9	9,6	18	9,5	0,963
No	87	90,6	85	90,4	172	90,5	
Alzheimer's disease							
Yes	16	16,7	34	36,2	50	26,3	0,002
No	80	83,3	60	63,8	140	73,7	
Other dementias							
Yes	13	13,5	13	13,8	26	13,7	0,954
No	83	86,5	81	86,2	164	86,3	
Heart diseases							
Yes	15	15,6	11	11,7	26	13,7	0,431
No	81	84,4	83	88,3	164	86,3	
Motor sequelae of CVA							
Yes	23	24,0	3	3,2	26	13,7	<0,001
No	73	76,0	91	96,8	164	86,3	
Arthritis/arthrosis/reumatism							
Yes	13	13,5	7	7,4	20	10,5	0,171
No	83	86,5	87	92,6	170	89,5	
Circulatory diseases							
Yes	11	11,5	5	5,3	16	8,4	0,128
No	85	88,5	89	94,7	174	91,6	
Respiratory diseases							
Yes	3	3,1	5	5,3	8	4,2	0,451
No	93	96,9	89	94,7	182	95,8	
Cancer							
Yes	6	6,3	0	0,0	6	3,2	0,014
No	90	93,8	94	100,0	184	96,8	
Daily Life Basic Activities (DLBAs)							
With difficulties	86	89,6	59	62,1	145	75,9	<0,001
Without difficulties	10	10,4	36	37,9	46	24,1	
Practice of physical activity							
Yes	11	11,5	47	49,5	58	30,4	<0,001
No	85	88,5	48	50,5	133	69,6	
Consumption of medicine							
From 1 to 5	32	34,4	46	51,1	78	42,6	0,010
From 6 to 10	46	49,5	40	44,4	86	47,0	
11 and more	15	16,1	4	4,4	19	10,4	
Health condition							
Excellent/good	36	37,5	58	61,1	94	49,2	0,001
Fair/poor/really poor	60	62,5	37	38,9	97	50,8	

disease, which is a progressive and debilitating degenerative disease characterized by tremors and slowness of movement and conversation, these difficulties increase the chances of the elderly suffering falls and consequently fractures; Alzheimer's, which already in the mild stage can cause apraxia (inability to perform complex movements such as driving and dressing); osteoarthritis, which is a degenerative joint disease responsible for the major complaints of movement; as well as disorders of the cardiovascular system.⁴

Due to the accessory mechanisms and difficulties to walk, the rates of impossibility to walk were high, followed by the use of orthoses. In long-term institutions, difficulty walking is frequent, however, rates vary greatly as to the accessory device. According to Alencar et al.¹⁰, among the elderly evaluated, 61.7% used a gait aid. The authors identified that 42.5% used a walker, 12.8% a wheelchair and 6.4% a walking stick. Also, there is a discrepancy between the studies regarding the frequency of use of the orthosis. Menezes et al.¹⁵ found that of the total of 95 elderly evaluated, 1.05% used a walker and 13.7%, a walking stick. In the study by Gonçalves et al.¹⁶, there was a high difference in the numbers of wheelchair users, since only 8.8% used wheelchairs, 7.2%, a walker, 13.5% a cane and 6.1% crutches. In the study by Ferreira and Yoshitome, 13 of the locomotion aid equipment, the walking stick was the most used 42.2%, 17.8% used a wheelchair and 2.2% used a walker, 35.6% did not need any help to walk.

With the advancement of the age it appears in some moment, impediments to accomplish some daily activities. The results of this research show that 75.9% of the elderly present difficulties to do DLBAs. Among those with difficulty locomotion, the dependence to do DLBAs was even more pronounced, with a significant correlation. This high rate of dependence is reported by Del Duca et al.¹⁷ in the study on the performance of daily living basic activities with the Katz Index, with 393 elderly institutionalized in Pelotas-RS. The authors found that 79.4% of the elderly were dependent to perform at least one task.

The DLBAs depend on an adequate functioning, according to the complexity of the activity, of the main functional systems: cognition, humor, mobility and communication. The process of loss of independence begins with the more complex tasks, with greater demands, such as bathe and progress to dependence to feed.¹⁸ Therefore, elderly people with difficulties in wandering lose the full functioning of at

least one of the main systems that are responsible for independence in the performance of DLBAs, which is the locomotor system.

The most frequent diseases were hypertension, Alzheimer's, diabetes, other unspecified dementias, heart disease, stroke sequelae, arthritis/arthrosis. Pelegrin et al.¹² identified a high prevalence of arterial hypertension, with 47.2%, followed by diabetes 18%, 13.9% osteoporosis, 13.9% dementia and 12.5% had had a stroke.

The sequelae of CVA, in most cases, cause a pathological march known as spastic, due to the installation of hemiplegia or hemiparesis. In these cases the lower limb becomes rigid, slightly flexed in the hips and extended in the knee; the foot remains in plantar flexion and when walking, it scrapes across the ground. To compensate for this problem, the individual swings the affected leg in an outer arc (circumference) at each step. These sequels lead to a compromise in balance.⁴

Individuals in advanced stages of Alzheimer's experience a gait known as magnetic gait, which is characterized by the broad base, slightly bent posture, small, rapid steps. There is a difficulty in starting the step and once started, the person may stop it abruptly.⁴ Thus, both the sequelae of stroke and Alzheimer's influence negatively on balance and gait performance, which predisposes the recommendation of auxiliary devices to walk or even prevent this activity.

The majority of the institutionalized elderly used some kind of medicine (97.4%). The need for drugs in the elderly is expected, especially in institutions, as shown by the study by Alencar et al.¹⁰ with 91.5% of the elderly surveyed using at least one drug. Gonçalves et al.¹⁶ found that 83.3% of the elderly used at least one medication, in the study by Menezes et al.¹⁵, it was verified that 91.6% use at least one medication. Due to the complexity of the clinical problems, polypharmacy becomes common among the elderly, which increases the chances of adverse effects such as dizziness, sedation, postural hypotension, mental confusion, delusions, falls, among others,¹⁹ which negatively affects the performance of a safe walking.

There is a significant correlation between the difficulty of locomotion and the practice of physical activity. For the performance of most physical activities it is necessary for the individual to be able to do so, with evaluation of the cardiovascular, respiratory, anthropometric measurements, neuromotor tests, metabolic evaluation, identification of limitations,

etc.²⁰ It is necessary to emphasize that the practice of physical activity promotes benefits at any age, with an improvement in the quality of life, maintenance of functional capacity and preserves physical and mental skills acquired throughout life.²¹

Older people who had mobility impairment self-perceived their health as regular, bad or very bad. The health complications experienced by the majority of the elderly directly influence the worst perception of health, however, the factor that seems to intensify the complaint of the worst health conditions is functional incapacity and loss of autonomy.²²

This study presents as main limitation the impossibility of temporal interrelationship, thus, associations and data need to be interpreted with care. Longitudinal studies to follow the process of impairment of gait in institutionalized elderly could clarify cause and effect relationships more accurately.

CONCLUSION

It was identified a high prevalence of elderly people who need help or even can not walk in institutions. The mobility impairment were associated with Alzheimer's disease, stroke motor sequelae, difficulties to perform daily living basic activities, physical inactivity, high medication consumption and poor health perception. These findings are cause for concern, since these elderly people are likely to have gait difficulties, which increases the chances of accidents and/or the evolution of the condition to situations of total dependence.

Measures aiming at minimizing the complications inherent in the mobility dependence should be stimulated. Preventive actions in order to avoid or delay the difficulty of locomotion, with the maximum maintenance of the locomotor skills should be taken. For those with more severe conditions, wheelchair and bedridden, the focus is on the complications caused by immobilization, as well as the incentive of any and all functioning muscle groups.

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