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Functional capacity to perform activities of daily living among older persons living in rural areas registered in the Family Health Strategy

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Abstract *This article describes the socioeconomic profile and functional capacity of older persons living in rural areas in the Municipality of Pelotas-RS, Brazil based on the following sociodemographic characteristics: age, sex, income, schooling and chronic diseases. A cross-sectional analytical study was conducted between July and October 2014 using a sample of 820 older persons. We used the Pearson chi square test of homogeneity for nominal variables and the test for trend for ordinal variables. The majority of the sample was made up of women aged,60-69 years, who were white and living with a partner. With regard to functional capacity to perform basic activities of daily living (BADL), 81.8% of individuals were classified as independent, while 54.6% were deemed completely independent for performing instrumental activities of daily living (IADL). Variables such as sex (male), age (60-69 years age group) and not having any heart problems were closely associated with the ability to perform BADL , while the ability to perform IADL was associated with age (60-69 years age group), income (1-2 salaries), education (5-8 years), and no osteoporosis. The majority of the people assessed by this study were able to perform both basic and instrumental activities of daily living.*

Key words *Primary Health Care, Health of the elderly, Rural population, Family health*

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Introduction

Brazil's population is aging rapidly. The number of older persons in the country is expected to increase to 30.9 million by 2020, which is equivalent to 14% of the overall population, meaning that Brazil will soon occupy sixth place among the countries with the largest population of older persons. According to the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística* – IBGE), the number of people aged 60 years or over will rise to 58.4 million (26.7% of total population) by 2060, overtaking the number of children up to the age of 14 years[1].

Given the exponential growth in the number of older persons in the country, multiple concerns have arisen regarding functional capacity; defined as the ability to perform activities that enable self-care and independent living[2]. Since it assesses quality of life, functional capacity evaluation provides more comprehensive health indicators than purely assessing morbidity[3] and is therefore essential for defining the most appropriate interventions and monitoring the clinical and functional status of older persons[4].

Functional capacity is evaluated based on the ability to perform basic activities of daily living (BADLs), such as bathing, dressing, eating, and toileting[5], and instrumental activities of daily living (IADLs), including shopping, using the telephone, driving and using public transport[6].

Individual factors directly associated with the loss of functional capacity among older persons include age and socioeconomic and health status[3].

A study conducted in the south of Brazil comparing levels of independence related to activities of daily living (ADLs) among people aged 80 years or over in three separate regions showed that independence was greatest among individuals from rural areas[7]. Another study regarding the health of elderly people living in a rural community in the south of the country observed that levels of independence were highest among women and that a significant portion of individuals (52.9%) were slightly dependent, suggesting that older persons in the community were in the early stages of functional decline[8].

Another study carried out in a rural area in the State of Minas Gerais explored the association between age, socioeconomic status and quality of life and functional capacity among older persons, showing that 99.8% of the sample were independent when it came to performing BADLs. The study also identified an association between low levels of schooling, older age and morbidity and the inability to perform IADLs[9].

Despite the fact that the health and socioeconomic status of people living in rural areas in Brazil is generally poorer than that of people living in urban areas[10], little research has been carried out into the factors associated with lack of functional capacity among older persons living in rural areas. The State of Rio Grande do Sul accounts for 13.65% of the country's population of people aged 60 years or over and occupies fourth place among the states with the largest population of older persons. In the municipality of Pelotas, 15.8% of older persons live in rural areas[1]. The present study therefore aims to describe the socioeconomic profile of older persons living in the rural areas of this municipality, their functional capacity to perform basic and instrumental daily activities and the association between functional capacity and age, sex, income, schooling and chronic non-communicable diseases.

Methodology

A cross-sectional analytical study was conducted using a representative sample of older persons living in rural areas of the municipality of Pelotas registered in the Family Health Strategy (*Estratégia de Saúde da Família* - ESF). Pelotas has a rural population of 22,082 people, of which 15.8% are aged 60 years or over[1].

The sample size was calculated based on the number of older persons living in rural areas registered in the ESF (2,920 individuals), a 95% confidence interval, an estimated prevalence of the outcome of 60% and acceptable margin of error of 3 percentage points, as adopted by Del Duca GF et al. in a study conducted in Pelotas in 2009[5]. Based on these parameters, the initial necessary sample size was calculated to be 758 older persons plus 10% to compensate for possible losses/refusals, resulting in a final sample of 834. Research participants were randomly selected from lists of older persons registered in 10 Family Health Centers (*Unidades de Saúde da Família*) drawn up by the Municipal Health Department from the health records of each center. Where more than one older person was registered in the same record, all older persons living in the household were deemed eligible to participate in the study. The number of older persons interviewed in each health center was calculated as a proportion of the total number of older persons registered in the center resulting in the following distribution: Vila Nova,

111; Grupelli, 94; Monte Bonito, 54; Cordeiro de Farias, 82; Osório, 73; Corrientes, 72; Pedreira, 80; Maciel, 78; Triunfo, 70; and Cerrito Alegre, 122.

Participants had to meet the following inclusion criteria: be aged 60 years or over, be living in a rural area in the Municipality of Pelotas, have been randomly selected by the team of researchers, have accepted to participate in the study. Exclusion criteria were: away at the time of data collection, person subject to an authorized deprivation of liberty, moved house, institutionalized/in hospital, and the old person and person responsible/helper is physically, cognitively and emotionally unable to participate in the study. A maximum of three attempts were made to interview the older person, after which the interview was considered a loss.

The participants were interviewed by five postgraduate and five graduate students from the Faculty of Nursing who received 30 hours of training over a period of five days.

Functional capacity was measured using the Katz index of independence in activities of daily living and the Lawton Brody Instrumental Activities of Daily Living Scale. The Katz & Akpom[11] index scores were grouped and the older persons were classified as follows: independent (does not need help to carry out any activity), moderately dependent (needs help to carry out between one and three activities), and dependent (needs help to carry out between four and six activities). For the Lawton & Brody[6] scale older persons were grouped as follows: independent (27 points), partially dependent (26 to 18 points), and dependent (under 18 points).

The information was provided by the old person or, in cases where the interviewee was unable to respond, by the person responsible/helper. The following independent variables were considered: sex (male/female), age (60-69 years, 70-79 years, and 80 years or over), skin color (white/not white), marital status (living with or not living with a partner), lives alone (yes/no), went to school (yes/no), years of schooling (< 1 year, 1-3 years, > 3 years) , profession (farmer, other), monthly income (< 1 minimum salary, 1-2 minimum salaries, > 2 minimum salaries) and whether he/she has a chronic non-communicable disease (arterial hypertension; diabetes mellitus; rheumatism; osteoporosis; circulatory, respiratory and heart disorders; stroke).

Prevalence of the categorical variables and the mean and standard deviation of continuous variables were calculated. The association between functional capacity and the independent variables was tested using the Pearson chi square test of homogeneity for nominal variables and the test for trend for ordinal variables.

The study was carried out between July and October 2014. After completing the interviews, 3% of the interviewees were re-interviewed by telephone to assure the quality of data.

The research project was approved by the Research Ethics Committee. The study strictly complied with the guidelines and norms set out in the National Health Council Resolution Nº. 466/2012[12] and the informed consent of research participants was obtained. The authors declare that there are no conflicts of interest.

Results

There were a total of nine refusals and five losses, because the older persons were not at home, meaning that a total of 820 older persons were interviewed.

The majority of the sample were female (n = 460, 56.1%). Average age was 70 years, with a standard deviation of 7.6 years and a minimum age of 60 and maximum of 95 years. The large majority of the sample were white (n = 740, 90.2%), while 71.5% (n = 586) had a partner. Average number of years of schooling was four years, with a standard deviation of 2.4 years and minimum of zero years (where the older person stated not having concluded the first year of primary school) and maximum of 23 years. The majority of the interviewees (n = 746, 91%) lived with somebody. The average number of people living with the older persons was two, with a standard deviation of one person and a minimum of one person and maximum of 15. The large majority of interviewees (n = 793, 91.8%) were retired; however, 35.5% still practiced some kind of work activity. The most common profession was "agriculture" (n = 574, 72%) and 80.1% of participants (n = 653) had a monthly income of between one and two minimum salaries (Table 1).

With respect to the Katz index of independence in activities of daily living, 81.8% (671) of older persons did not need help to perform any activity, while 14.2% (117) needed help to perform one or two activities, considered moderately dependent. Only 2% (16) were classified as totally dependent.

With respect to the Lawton Brody Instrumental Activities of Daily Living Scale, 54.6% (448) of the older persons were classified as totally independent.

With regard to the basic activities of daily living, the prevalence of "lack of independence" was highest for the activity *toileting*, where 14.5% of participants needed help (n = 119), while the prevalence of "independence" was highest for the activity *eating*, where 98.2% (n = 805) of participants stated that they did not need any help (Table 2).

With regard to instrumental activities, 27.4% (n = 225) and 33.9% (n = 378) of older persons stated that they were unable or required partial assistance to perform the activities *getting to places beyond walking distance* and *administering finances*, respectively. The interviewees showed greatest independence with the activity preparing own meals (n = 747, 91.1%), Table 3.

With respect to BADLs, it was found that 46.2% (n = 310) of the older persons classified as totally independent were women and 53.8% (n = 361) were men (p= 0.006), while 69% (87) of moderately dependent participants were women, showing that being male is a protective factor for the maintenance of functional capacity.

The prevalence of independence among participants aged between 60 and 69 years was 57.9% (338), while among the 90 year and over age group it was only 0.4% (3). The prevalence of lack of functional capacity was greatest among the 70 to 79 and 80 to 89 years age groups, which together accounted for 69.5% (n = 16) of all dependent individuals.

No significant association was found between the variables schooling and income and functional capacity. However, it is worth noting that the majority of independent individuals (n = 362, 63.3%) had between one and four years of schooling, which was also the average of the other categories. In all categories the majority of individuals had a monthly income of one to two minimum salaries: 80% (n = 553) in the independent category, 77.8% (n = 98) in the moderately dependent category, and 95.7% (n = 22) among the dependent category.

No association was found between chronic non-communicable diseases and functional capacity to perform BADLs, expect for heart problems (p = 0.011), despite the significant prevalence of arterial hypertension and vision disorders in all categories (Table 4).

No significant association was found between functional capacity to perform instrumental activities and sex. Age was a relevant factor with respect to IADLs (p < 0.001): the 60 to 69 years age group accounted for 68.9% (308) of all independent individuals. A significant association was also found between functional capacity for instrumental activities and schooling (p < 0.001).

Table 1. Prevalence of functional capacity according to the Katz index of independence in activities of daily living and Lawton Brody Instrumental Activities of Daily Living Scale. Pelotas, 2014.

	%	n
Katz index*		
0	81.8	671
1	12.4	102
2	1.8	15
3	1.1	9
4	0.9	7
5	0.4	3
6	1.6	13
Lawton-Brody score		
Independent	54.6	448
Partially dependent	37.9	311
Dependent	7.5	61
Total	**100**	**820**

*Number of activities that the old person needs help to perform.

Table 2. Prevalence of functional capacity to perform basic activities of daily living by activity according to the Katz index. Pelotas, 2014.

Basic activity of daily living	%	n
Bathing		
Help needed		
Yes	6.1	50
No	93.9	770
Dressing		
Help needed		
Yes	6.0	49
No	94	771
Using the toilet		
Help needed		
Yes	2.8	23
No	97.2	797
Transferring		
Help needed		
Yes	2.9	24
No	97.1	796
Toileting		
Help needed		
Yes	14.5	119
No	85.5	701
Eating		
Help needed		
Yes	1.8	15
No	98.2	805
Total	**100.0**	**820**

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Table 3. Prevalence of functional capacity to perform instrumental activities of daily living by activity according to the Lawton-Brody scale. Pelotas, 2014.

Instrumental activity	%	n
Using the telephone		
Unable	12.7	104
Partial assistance required	6.1	50
No assistance required	81.2	660
Getting to places beyond walking distance		
Unable	8.9	73
Partial assistance required	18.5	152
No assistance required	72.6	595
Shopping		
Unable	6.6	54
Partial assistance required	15.0	123
No assistance required	78.4	595
Preparing meals		
Unable	5.1	42
Partial assistance required	3.8	31
No assistance required	91.1	747
Cleaning		
Unable	6.8	56
Partial assistance required	5.7	47
No assistance required	87.5	717
Manual work		
Unable	8.0	66
Partial assistance required	6.0	49
No assistance required	86.0	705
Washing and ironing		
Unable	7.8	64
Partial assistance required	5.1	42
No assistance required	87.1	714
Taking medication		
Unable	4.2	72
Partial assistance required	5.7	47
No assistance required	90.1	739
Administering finances		
Unable	8.8	72
Partial assistance required	25.1	206
No assistance required	66.1	524
Total	**100,0**	**820**

In each category the large majority of individuals had between one and four years of schooling, while the proportion of individuals with between five and eight years of schooling was greatest among individuals in the independent category (34.5%, 140). A significant association was also found between functional capacity and income ($p = 0.007$).

Among the chronic non-communicable diseases (CNCDs), only osteoporosis was found to be significant at $p = 0.005$: among the independents it was found to have a prevalence of 82.6% (370) and among the dependents, 96.7% (59). It is important to note that, although no significant association was found between the variables hypertension and vision disorders and functional capacity, the prevalence of these conditions was high in all categories (Table 5).

Discussion

The results of this study are similar to the findings of a study conducted in the rural area of the Municipality of Uberaba in the State of Minas Gerais[9], where the majority of people in the 60 to 69 years age group were women (63.6%). These findings contrast with the results of the 2013 National Household Survey (PNAD, acronym in Portuguese) carried out by the IBGE[13], which provides a different picture of older persons living in rural areas in Brazil, showing that there are 1.3 million more men than women (15.29 million older men compared to 14.08 million older women). This fact however should be relativized, since the PNAD is a national survey and this difference may be accounted for by regional differences.

With respect to skin color, the majority of participants stated that they were white while over half the rural population in Brazil consider themselves brown[13]. However, the findings of the present study simply confirm the history of colonization of the south of Brazil, first through mainly German families and later Italian, French, Austrian, Portuguese and Spanish[14].

The majority of participants stated having gone to school, which differs from the findings of a study carried out in a rural community in the northeast that showed that 61.33% of older persons were illiterate[15]. This discrepancy may be due to a number of factors. One possible explanation is that during the post-war period in the 1950s when these older persons were beginning their studies, Brazil underwent a number of changes in relation to education due to the large contingent of immigrants. At the time, the government aimed to homogenize schools to build a white, Western and Christian country that excluded people of African descent, explaining the high levels of illiteracy among older persons in the State of Bahia in the Northeast of Brazil, which was colonized mainly by Negros brought from Africa by the slave trade[16]. The situation was similar between the Germans and Italians. However, due to the strong links between culture, re-

Table 4. Prevalence of functional capacity to perform BADLs by age, sex, income, schooling and chronic non-communicable diseases. Pelotas, 2014.

Variables	Independent n = 671 % (n)	Moderately dependent n = 126 % n	Dependent n = 23 % n	p value*
Sex				**0.006**
Male	46.2 (310)	31.0 (39)	47.8 (11)	
Female	53.8 (361)	69.0 (87)	52.2 (12)	
Age*				**< 0.001**
60-69 years	57.9 (388)	45.2 (57)	21.8 (5)	
70-79 years	33.6 (225)	27.8 (35)	39.1 (9)	
80-89 years	8.1 (54)	23.0 (29)	30.4 (7)	
90 years or over	0.4(3)	4.0 (5)	8.7 (2)	
Years of schooling				**0.135**
< 1 year	0.9 (5)	0.9 (1)	4.7 (1)	
1- 4 years	63.2(362)	72.5 (79)	52.4 (11)	
5-8 years	31.2 (179)	24.8 (27)	42.9 (9)	
> 8 years	4.7 (27)	1.8 (2)	0.0 (0)	
Income**				**0.358**
< 1 minimum salary	1.2 (8)	0.8 (1)	0.0 (0)	
1-2 minimum salaries	80.0 (533)	77.8 (98)	95.7 (22)	
> 2 minimum salaries	18.8 (125)	21.4 (27)	4.3(1)	
Diabetes Mellitus				**0.891**
Yes	17.3 (116)	15.9 (20)	13.0 (3)	
No	82.7 (555)	84.1 (106)	87.0 (20)	
Hypertension***				**0.514**
Yes	66.3 (445)	62.4 (78)	73.9 (17)	
No	33.7 (226)	37.6 (47)	26.1 (6)	
Rheumatism				**0.216**
Yes	29.4 (197)	22.2 (28)	21.7 (5)	
No	70.6 (474)	77.8 (98)	78.3 (18)	
Osteoporosis				**0.243**
Yes	17.4 (117)	15.1 (19)	4.4 (1)	
No	82.6 (554)	84.9 (107)	95.6 (22)	
Vision disorders				**0.161**
Yes	79.7 (535)	72.2 (91)	82.6 (19)	
No	20.3 (136)	27.8 (35)	17.4 (4)	
Breathing disorders				**0.320**
Yes	12.7 (85)	8.7 (11)	4.4 (1)	
No	87.3 (586)	91.3 (115)	97.6 (22)	
Heart problems				**0.011**
Yes	29.2 (196)	16.7 (21)	26.1 (6)	
No	70.8 (475)	83.3 (105)	73.9 (17)	
Stroke				**0.263**
Yes	8.4 (56)	8.7 (11)	17.4 (4)	
No	91.6 (615)	91.3 (115)	82.6 (19)	

* One missing, n = 819. ** Five missing, n = 815. *** One missing, n = 819.

ligion and education, they organized themselves and, in the face of the indifferent attitude of the Brazilian government towards their demands, started to create community schools that provided the community with basic education[17]. Thus it is assumed that, despite the difficulties imposed by the state, German children at the time had greater access to basic education, in contrast to children of African descent, which explains why the level of schooling among older persons in rural areas of Pelotas is higher than the norm of the time.

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Table 5. Prevalence of functional capacity to perform IADLs by age, sex, income, schooling and chronic non-communicable diseases. Pelotas, 2014

Variables	Independent n = 448 % (n)	Partially Independent n = 311 % n	Dependent n = 61 % n	p value*
Sex				0.345
Male	46.2 (207)	41.2 (128)	41.0 (25)	
Female	53.8 (241)	58.8 (183)	59.0 (36)	
Age*				< 0.001
60-69 years	68.9 (308)	42.1 (131)	18.0 (11)	
70-79 years	28.0 (125)	38.9 (121)	37.7 (23)	
80-89 years	3.1 (14)	17.4 (54)	36.1 (22)	
90 years or over	0.0 (0)	1.6 (5)	8.2 (5)	
Years of schooling				< 0.001
< 1 year	0.5 (2)	1.2 (3)	3.8 (2)	
1- 4 years	58.4 (237)	72.2 (176)	73.6 (39)	
5-8 years	34.5 (140)	25.8 (63)	22.6 (12)	
> 8 years	6.6 (27)	0.8 (2)	0.0 (0)	
Income**				0.007
< 1 minimum salary	23.2 (104)	13.4 (41)	13.1 (8)	
1-2 minimum salaries	75.5 (338)	85.6 (262)	86.9 (53)	
> 2 minimum salaries	1.3 (6)	1.0 (3)	0.0 (0)	
Diabetes Mellitus				0.327
Yes	15.9 (71)	19.3 (60)	13.1 (8)	
No	84.1 (377)	80.7 (251)	86.9 (53)	
Hypertension***				0.727
Yes	65.3 (292)	65.9 (205)	70.5 (43)	
No	34.7(155)	34.1 (106)	29.5 (18)	
Rheumatism				0.469
Yes	28.4 (127)	28.9 (90)	21.3 (13)	
No	71.6 (321)	71.1 (221)	78.7 (48)	
Osteoporosis				0.005
Yes	17.4 (78)	18.3 (57)	3.3 (2)	
No	82.6 (370)	81.7 (254)	96.7 (59)	
Vision disorders				0.244
Yes	77.5 (347)	78.8 (245)	86.9 (53)	
No	22.5 (101)	21.2 (66)	13.1 (8)	
Breathing disorders				0.370
Yes	12.7 (57)	11.6 (36)	6.6 (4)	
No	87.3 (391)	88.4 (275)	93.4 (57)	
Heart problems				0.673
Yes	28.1 (126)	26.7 (83)	23.0 (14)	
No	71.9 (322)	73.3 (228)	77.0 (47)	
Stroke				0.716
Yes	8.3 (37)	9.7 (30)	6.6 (4)	
No	91.7 (411)	90.3 (281)	93.4 (57)	

* One missing, n = 819. ** Five missing, n = 815. *** One missing, n = 819.

The majority of the participants stated that they were retired; however, 35% also affirmed that they continue to practice some kind of work activity. This is a common trend in rural settings in Brazil. The results of a study regarding the impact of the determinants of the work and retirement situation of the elderly suggest that the likelihood of older people undertaking manual activities decreases with age, as physical capacity declines[16]. The findings of the present study confirm this, since 75.3% of the participants that stated they undertake manual activities were

from the 60 to 69 years age group ($p < 0.0001$). Another likely factor is that average income is a minimum salary (base year 2014), which often does cover the main household outgoings. Furthermore, it is important to consider the fact that the old notion of 'rural' has always been rooted in agriculture and therefore economic activity. Traditionally, rural settings have been strictly and restrictively seen as places of economic exploitation[17]. Therefore, it could be assumed that, despite being retired, the participants continue to work because they feel, and are, functionally capable of doing so.

The results of the present study show that the majority of participants were totally independent when it comes to basic activities of daily living, compared to 99.8% of participants in the study undertaken in Minas Gerais[9]. This difference may be explained by the inclusion criteria adopted in the latter study that encompassed only older persons who had attained a minimum score of 13 points in Mini Mental State Examination (MMSE). Another study conducted in a rural community in the northeast showed that 78% of the older persons assessed using the Barthel scale were dependent in some way.

The difference between functional capacity between older persons in the south and northeast may be explained by the fact that the average age of the participants in the south was around four years younger and average level of schooling was also higher. It is also important to note however that the tests used to measure functional capacity were different, which hinders comparisons.

The results of the present study also showed that men were more independent than women in performing BADLs, corroborating the findings of a study conducted in Nova Roma in the southern state of Rio Grande do Sul[8], and a study undertaken in an urban are in Pelotas that observed an association between sex and age and functional capacity ($p = 0.05$ and $p < 0.001$, respectively)[5]. This reaffirms that it is important for health professionals to pay special attention to older women. One factor that may have influenced this variable is that the majority of research participants were women, particularly in the older age groups.

Toileting (urinary and fecal incontinence) appeared to be the most difficult activity for older persons, which is consistent with the findings of two other studies carried out in urban areas, one of which in Pelotas, where the prevalence of inability to perform this activity was found to be 28.6%[15] and 21.3%[5]. This finding shows the importance of intervening early in such situations in order to help older people maintain bladder and bowel control. Incontinence can often be an embarrassing and awkward problem to deal with. Health professionals should therefore first create a bond of trust with the older person to make him/her feel at ease in talking about such problems and follow appropriate advice.

The only chronic non-communicable disease associated with functional capacity to perform BADLs was heart problems, despite other studies that have shown an association between diseases such as arterial hypertension and diabetes mellitus[18]. The effects of aging on the circulatory system facilitate the development of a variety of cardiovascular diseases that influence functional capacity. One of the limitations of this study was the fact that the type of heart disease was not identified[19]. Heart disease can directly influence the ability to perform simple daily activities such as dressing and transferring, depending on the degree of cardiovascular impairment.

The most prevalent chronic non-communicable disease among the study sample was arterial hypertension and the rate was highest among older persons classified as dependent. It can be assumed that chronic non-communicable disease did not influence the ability to perform activities because they had not yet reached a stage that seriously affects functional capacity, which demonstrates that it is fundamentally important that health professionals assist patients to control these diseases, particularly through changes in habits.

Over 50% of the participants of the current study were considered independent when it comes to performing IADLs, in contrast to the findings of a study carried out in Goiânia[20] that showed that 58.1% (61) of older persons had some level of dependence. A study undertaken in inland Bahia[15] observed that 65.3% (98) of the research participants were dependent, showing that older persons are more dependent when it comes to performing IADLs. Instrumental activities have greater cognitive demands and require greater social resourcefulness and the capacity to deal with adversities, which is influenced by level of schooling. It is therefore assumed that, given the high p-value, level of schooling is one of the key factors affecting functional capacity in the current study.

The research participants maintained their independence in performing IADLs, principally in relation to taking medication and preparing meals. It is important for health professionals to be aware of an older person's functional capacity in order to stimulate them to performing such

activities. Health professionals can facilitate drug therapy using clinically relevant teaching resources, adapted according to the older person's level of understanding, and by providing guidance as to dosage and frequency. With respect to diet, it is important to highlight that older persons who are able to prepare their own meals are also able to determine their own food choices. It is also important to note that the percentage of participants that needed help was particularly high for the activity *getting to places beyond walking distance*. These results seem to be consistent with the findings of a study[5] carried out in the urban area, which found that around 43% of older persons experienced difficulties in using means of transport. These findings show that the fact that the participants in the current study live in rural areas does not hinder their access to other places.

The prevalence of dependence was highest for the activity *administering finances*, which differs from the findings of a study carried out with older persons from the same region but living in urban areas, which showed that only 11.8% (70)[5] of individuals experienced some kind of difficulty with this activity, despite having similar levels of schooling. It could be said that the fact of living in a rural area, and theoretically having less access to technology, means that older persons feel more insecure in relation to performing activities related to financial matters.

Age, income and schooling were factors that influenced functional capacity for performing IADLs. These findings are in agreement with a study carried out with older persons living in urban areas[5] and reaffirms that older persons of a more advanced age with low income and level of schooling are more vulnerable to loss of functional capacity. As a result, this group needs direct care, not only from health professionals, given that functional capacity involves other dimensions such as education and socioeconomic status.

Despite the fact that arterial hypertension, rheumatism and vision disorders were the most prevalent chronic non-communicable diseases in all groups, osteoporosis - a metabolic bone disease caused by the loss of mineral content and the microarchitectural deterioration of bone tissue that results in bone fragility[21] – was the only disease that had a significant association with functional capacity. Osteoporosis can directly influence functional capacity for activities that require greater agility such as *shopping* and *getting to places beyond walking distance*.

One of the limitations of the study was the exclusion of two areas that are not part of the ESF. These areas were excluded due to difficulties in identifying and contacting the older persons living these areas given that the study did not have the necessary resources to carry out a survey. However, this study makes a particularly important contribution to research in this field since it assessed people living in rural areas, confirming that these areas present considerably different risk factors and protective factors to those of urban areas, which should equally be taken into account when designing prevention strategies.

Conclusion

The results of this study show that the majority of the participants were female, aged between 60 and 69 years, had an average of four years of schooling, a monthly income of between one and two minimum salaries, lived with a partner, were retired and practiced some kind of work activity. The older persons assessed by this study demonstrated that they had the functional capacity to perform both basic and instrumental activities of daily living. The independent variables age, income and schooling had a positive influence on ability to carry out activities. Given the fact that the majority of studies focus on urban areas, it is hoped that the findings of this study and the initiative taken to concentrate on older persons living in rural areas will serve to encourage further research that contributes to maintaining and improving the functional capacity of this group.

Collaborations

AH Pinto realized the construction of the article, data analysis, and review. Main author of article from the master's thesis. C Lange was the supervisor of the dissertation, assisting in building and revising it. CA Pastore helped in supervision, assisted in data analysis and the construction of the article. PMP de Llano has helped in the data analysis and review of the text, contributing to the foundation of the article. DP Castro and F dos Santos assisted in data collection and revising it.

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