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Cognitive, functional, social and health assessment in elderly of rural areas

Abstract

The aim of this study was to determine the cognition, degree of functional independence, physical health (diagnosed diseases, medications) and social functions and relationships of elderly people living in a rural area of Araraquara (Sao Paulo, Brazil). Seventy-six elderly individuals were interviewed and completed a structured questionnaire based on BOMFAQ and adapted from the OARS questionnaire. Mini Mental State Exam (MMSE) was used to assess the cognitive status, and the functional condition by combining the scales of basic and instrumental activities of daily living. Considering the educational level, 17.1% of the elderly presented cognitive impairment and did not consider schooling 92.1%; 76.3% had dependence on at least one activity of daily life, 88.2% reported having a diagnosed disease, and the most frequent condition was hypertension (37.5%). It was concluded that the elderly who live in the settlement evaluated need a broader approach to social and health conditions that may contribute substantially to family education and training in elder care, periodic medical follow-up, and provision of specific care.

Keywords: aged, rural settlements, health of the elderly, cognition, chronic disease

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Introduction

The aging of the world's population and specifically the Brazilian population is a fact and is expected to reach 66.5 million by 2050,[1] becoming the sixth largest population of older people in the world.[2] As the number of elderly people increases, issues related to senescence become increasingly important, and it is a great challenge to maintain mobility and quality of life in old age.[3] The concept of healthy aging advocated by the World Health Organization[2] requires a transformation of health systems away from curative models based on disease and a fundamental change in understanding about aging taking into account the inequalities of the different populations of the elderly, whose health must be measured and monitored.

The stratification of population health based on social, cognitive and functional dependence on health care at the primary level can be a powerful booster for prioritizing, planning, implementing and expanding interventions to improve the quality of life of the most vulnerable individuals.[4]

Cognitive function consists of an important health factor and determinant of independence, as well as a better quality of life among older adults[5] and to promote healthy aging and care, is necessary an overview of the self-assessment of the elderly`s health.[6]
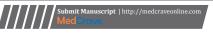
Cognitive impairment is common late-life comorbidity, the 10% of individuals older than 60 years have frank dementia.[7] Early identification of dementia is considered an important predictor of functional impairment,[8] and is fundamental in daily practice, although it is often overlooked until signs of functional impairment are apparent.[9] The Mini Mental State Examination (MMSE) is considered the most widely used instrument for functional capacity tracing and early identification of signs of dementia.[10]

In a large study carried out with MMSE in the Chinese elderly population, the number of years of formal education, residence in rural areas, age and female gender had a significant influence on the reduction of MMSE scores.[11] Iatraki et al.[12] applied the MMSE and two other screening instruments to 319 elderly rural dwellers in Greece and observed that lower MMSE values were related to older women with lower levels of schooling and with greater dependence.

A study of representative Brazilian elderly population[13] with the purpose of identifying regional differences in functional capacity found that, controlling factors such as age, educational level and residence in rural or urban areas, there are differences between the cognitive scores presented by the elderly, which occurred independently of the factors of potential confusion but in all regions, those with older age and lower education had the worst scores for memory and verbal fluency. The educational level is known as a risk factor for dementia and an element of interference in screening tests.[14] In a study with 65-75 years-old, female patients with dementia had a faster functional decline after two years of study compared to male patients.[15]

Functional impairment is considered a geriatric syndrome that increases the risk of mortality.[15] An epidemiological study carried out in the urban area of São Paulo found the existence of an elderly population, mostly very poor and cohabiting with multiple generations, with a high prevalence of disabilities, expressed by the inability to perform activities of daily living without assistance, with 40% of the elderly requiring assistance in at least one activity.[16] The authors also found that more than 80% of the participants reported at least one chronic disease present. After two years of the first evaluation, such population presented more than 60% prevalence of some physical limitation and 90% reported some chronic disease present, most giving a reasonably positive evaluation of their own health. The prevalence of the elderly who self-rated their health conditions as bad was similar to the prevalence of those with a high degree of dependence on daily life activities or a probable psychiatric disorder or cognitive impairment. According to the authors, the consequences of the growing number of elderly individuals with chronic diseases and associated disabilities impact the provision of informal care and the health system.[16]

A study with elderly people living in a peripheral and low-income neighborhood in the city of São Carlos, State of São Paulo, Brazil, and enrolled in the Family Health Program and in the Unified National Health System showed a population of illiterates of 49.8%, 82.1% living with children or grandchildren, 56.2% with indicative of cognitive impairment (MMSE < 24) and 74.9% with chronic diseases with regular use of medications in 67% of the elderly.[17]

Negrón-Blanco et al.[18] using WHODAS-12 verified that they tend to be older, female, have a lower level of schooling, are urban, have disability, depressive symptoms, have more pain, more hospital admissions and have diabetes, being a common problem in our environment. According to Zhang et al.[3] depression would still be a risk factor for cardiovascular disease and the association between such factors worsens health conditions and has a major impact on public health. As evidence shows, heart disease, circulatory problems, cognitive impairment, dementia and depression are the main health conditions contributing to the need for home care among the elderly and these conditions occur at higher rates for elderly people receiving home care.[19]

The arterial hypertension is the most common modifiable cardiovascular disease risk factor worldwide, increases with age and affects 65% of individuals 70 years and older.[20] Systemic arterial hypertension is directly or indirectly related to multiple conditions, especially stroke, coronary disease, congestive heart failure and chronic renal failure,[21] as well as being a strong predictor of mortality.[22] Georgakis et al.[23] investigated the influence of blood pressure on elderly mortality according to cognitive ability scores in the elderly using MMSE and found that elderly individuals with cognitive impairment (MMSE <24) may be more susceptible to the deleterious effects of mean lower arterial pressure and higher systolic blood pressure.

The literature has shown the importance of the broader knowledge of the health of the elderly, which should be known in order to design strategies aimed at quality of life and healthy aging[2] and in a more independent way. Rural elderly has been considered to be at greater risk of emergency care compared to urban elderly,[24] and have a poor quality of life, especially if they live alone.[25]

In a recent study[26] carried out in a rural population group, precarious oral health conditions was found with high prevalence of mucosal lesions, few teeth present and high need of prostheses, being such a highly vulnerable population and in need of government programs. It is necessary the broader vision of the social and health reality of the same community; this study had as objective the knowledge of the cognitive, functional, social profile and the presence of chronic diseases and the use of medicines of elderly people of rural area of Araraquara, State of São Paulo, Brazil.

Methods

Ninety-four elderly residents of the Bela Vista settlement (Araraquara São Paulo, Brazil) participated of this cross-sectional epidemiological study. The elderly should be over 60 years old to be included in this research; the only exclusion criteria were those patients who refused to participate. Medical information was confirmed in the patient's medical record.

The Research Ethics Committee of the School of Dentistry of Araraquara (Protocol 49/05) authorized this research and the elderly signed a consent form authorizing the interview. The data collected through an interview were based on a structured questionnaire - BOMFAQ (Brazilian OARS Multidimensional Functional Assessment Questionnaire), adapted from the OARS questionnaire.[16] The socio-demographic data included age in full years, age group, marital status, years of schooling, family income, and family structure, identifying those who live alone or with others, and expressed in terms of number of generations cohabiting in the house and scored as none (lives alone), one (spouse, close relative), two (children) or three (grandchildren).[26]

The questions included social functions and social relationships,[27] cognitive condition, functional condition (independence in daily and instrumental life), presence of diagnosed chronic diseases, ingested medications, and self-rated quality of life.

The cognitive status of the patients was investigated using the Mini Mental State Examination (MMSE).[10] The test consists of questions subdivided into six items: temporo-spatial orientation, recent memory or fixation (ability to retain new information), and evocation (ability to remember factor recently occurred - one or two days and old facts - one year), calculus, constructional ability (for example, copying three-dimensional figures) and language, where aphasia (language disorder), agnosia (inability to recognize or identify objects) and apraxia (difficulties in performing motor activities despite the intact comprehension and activities). For each patient's success, a point is added to the total, and it can reach a maximum score of 30 points. A standard 24-point cutoff point is used, and a score of 23 or less indicates cognitive impairment.

The educational level for MMSE evaluation was also adopted[28] to assess whether there is cognitive impairment or not. Thus, two MMSE scores were determined, one considering the educational level and the other not. If the patient did not understand the term "semester", this question will be replaced by the questioning about the elderly knowing the approximate hours, as suggested by Brucki et al.[29] for the use of the MMSE in Brazil.

The functional condition was determined based on the combination of the scales proposed of Basic Activities of Daily Life (BADL)[30] and the Instrumental Activities of Daily Living (IADL).[31] The BADLs refer to basic vital functions and are the last to be lost during the aging process, corresponding to the items bathing, dressing, toileting, transfer, continence, feeding; while the IADLs correspond to eight items: using the telephone, using transportation outside the home, shopping at the market, preparing meals, doing housework, washing clothes, handling medications and finances. The patient was classified with increasing dependence according to the number of activities in non-dependent, partially dependent and totally dependent. Scores were determined separately for the BADLs and for the IADLs.[32] A database was created and a descriptive statistical analysis of the variables was performed through tables and graphs.

Results

In a previously published study, demographic factors such as age, sex, schooling and family income were established.[26] Of the ninety-four-elderly living in the rural area selected for the study, only 76 elderly (80.9% of the elderly population living in the settlement) adequately completed all the steps to be included in the data. Results referring to the generations that cohabit the home, self-assessment of quality of life, cognitive and functional conditions, diagnosed chronic diseases and medications are found in Tables 1 to 7.

The cut-off of the MMSE values to determine the presence of cognitive impairment considered the degree of schooling (BERTOLUCCI et al.1994). Of the 76 patients interviewed, 17.1% (13 elderly) presented an indication of cognitive impairment, although the mean scores presented, ranging from 8 to 27, presented low values on average. Of the patients with impairment, 92.3% (12 elderly) were female and only 7.7% (1 elderly) was male. In addition, the elderly with cognitive impairment accounted for 23.1% and 20% of the patients in the age groups of 65 to 74 years and 75 to 84 years, respectively.

Table 1 Frequency of individuals and cohabiting generations at home according to age group

Age group	Residents				Cohabiting generations				
	1 a 2	3 a 4	5 a 6	7 ou +	0*	1*	2*	3*	4*
55 |---| 64	14.3	14,3	42.8	28.6	14.3	-	42.8	42.8	-
65 |---| 74	7.7	38.5	15.4	38.5	-	7.7	46.2	46.2	-
75 |---| 84	20.0	40.0	40.0	-	20.0	20.0	20.0	40.0	-
85 |---| 94	-	100.0	-	-	-	-	-	100.0	-
Total	11.9	32.9	27.6	27.6	7.9	7.9	39.5	44.7	-

0, alone; 1 spouse or close relative; 2, children; 3, grandchildren; 4,great grandchildren

Table 2 Absolute frequency (f) and percentage (fp) of individuals according to self-perception of quality of life (very good or good, reasonable or poor) and to age group

Age group	Quality of life						Total	
	Very good/good		Reasonable		Poor			
	f	fp	f	fp	f	fp	F	fp
55 |---| 64	3	14.3	18	85.7	0	-	21	100.0
65 |---| 74	27	69.2	9	23.1	3	7.7	39	100.0
75 |---| 84	6	40.0	9	60.0	0	-	15	100.0
85 |---| 94	1	100.0	0	-	0	-	1	100.0
Total	37	48.7	36	47.4	3	3.9	76	100.0

Table 3 Absolute frequency and percentage of elderly individuals with cognitive impairment obtained by Mini Mental State Examination (MMSE) scores. Average scores obtained by age group and gender

Age group	Cognitive impairment MMSE				Average scores of MMSE		
	male		female		male	female	Total
	f	fp	f	fp			
55 |---| 64	0	-	0	-	22.0	24.3	23.3
65 |---| 74	0	-	9	23.1	20.4	14.8	18.7
75 |---| 84	0	-	3	20.0	20.0	15.7	16.8
85 |---| 94	1	100.0	0	-	13.0	-	13.0
60 |---| 91	1	7.7	12	92.3	20.2	18.2	19.3

Table 4 Percentage frequency of elderly according to degree of functional impairment in the Basic Activities of Daily Living (BADLs) and Instrumental Activities of Daily Living (IADLs)

Age group	BADL			IADL			Total
	I	PD	TD	I	PD	TD	
55 |---| 64	71.4	28.6	-	57.1	42.9	-	100.0
65 |---| 74	46.2	53.8	-	30.8	69.2	-	100.0
75 |---| 84	80.0	20.0	-	20.0	80.0	-	100.0
85 |---| 94	-	100.0	-	-	-	100.0	100.0
60 |---| 91	59.2	40.8	-	35.0	63.7	1.3	100.0

I, independent; PD, partially dependent; TD, totally dependent

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Table 5 Frequency of the number of activities with dependence and average number of Basic Activities of Daily Living (BADL) and Instrumental Activities of Daily Living (IADL) committed according to the age group

Age group	Dependent activities				Average number of dependent activities	
	0	1 to 3	4 to 6	7 or more	BADL	IADL
55 |---| 64	28.6	42.8	14.3	14.3	0.4	1.7
65 |---| 74	23.1	30.7	23.1	23.1	0.8	2.7
75 |---| 84	20.0	40.0	40.0	-	0.9	2.5
85 |---| 94	-	-	-	100.0	2.0	5.0
60 |---| 91	23.7	35.5	23.7	17.1	0.9	2.4

Table 6 Absolute frequency (f) and percentage (fp) of diagnosed chronic diseases or alterations presented in the population in descending order

Chronic diseases	Frequency	
	f	fp
Systemic Arterial Hypertension	48	37.5
Gastrointestinal/stomach disorders	13	10.2
Diabetes Mellitus	12	9.2
Column Issues	9	6.9
Musculoskeletal problems	8	6.3
Osteoporosis	6	4.6
Stroke	6	4.6
Kidney problems	6	4.6
Labyrinthitis - dizziness	5	3.9
Frequent headaches	4	3.1
Rheumatoid arthritis	3	2.3
Heart Arrhythmias	3	2.3
Skin Changes	3	2.3
Breathing problems	2	1.6
Breast cancer	1	0.8
Total	128	100.0

Table 7 Absolute frequency (f) and percentage (fp) of medications routinely ingested by the elderly of Bela Vista settlement

Medications	Frequency	
	f	fp
Captopril	30	24.8
Hydrochlorothiazide	18	14.9
Nifedipino	3	2.5
Atenolol	4	3.3
Propranolol	4	3.3
Selopress (metoprolol tartrate and hydrochlorothiazide)	1	0.8
Spinolactone	2	1.7
Antiphylipine	3	2.5
Digoxin	3	2.5
Diuretic	7	5.8

Medications	Frequency	
	f	fp
Inalapril	5	4.1
AAS (antiplatelet)	6	5.0
Analgesic / Anti-inflammatory	8	6.6
Uric Acid	1	0.8
Ferrous sulphate	3	2.5
Gastritis Medications	3	2.5
Conversil	1	0.8
Insulin	4	3.4
Metformin - anti glycemic	5	4.1
Glibenclamide - antiglycemic	3	2.5
Mazepine	2	1.7
Fluxon	2	1.7
Conversil	2	1.7
Kindomet - methyldopa	1	0.8
Total	121	100.0

Without considering the degree of schooling, only 6 elderly (7.9%) would present normal values, i.e., MMSE score greater than 24 and therefore, 92.1% with indication of cognitive impairment, and not only 17.1%.

Of the 76 elderly people interviewed, 88.2% (67 patients) reported having a diagnosed disease, and the mean number of diseases among them was 1.9, while considering the total population studied, the average number of diseases was 1.7.

Hypertension was the most frequent condition in the studied population, considering that it corresponded to 37.5% of the reported diseases, reaching 63.2% of the elderly, although all undergo regular medical treatment for this condition. If we consider that arrhythmias and cerebrovascular accident are related to the cardiovascular system, this type of alteration affects 75% of the study population.

Of the elderly analyzed, only 8 (11.8%) reported not taking any medication routinely. For those who take drugs on a regular basis, the average number of drugs per senior citizen was 1.8, while considering the total population; the average number of drugs was 1.6. The top ten medications on the list refer to the control of cardiovascular diseases, which corresponds to 71.7% of the drugs used.

Discussion

In the Bela Vista settlement (Araraquara, SP, Brazil), 76 elderly people were interviewed, or 80.9% of the elderly population living in the settlement, 56.6% male and 43.4% female.[26] The prevalence of women in the elderly population was not verified in the present study, differently from Feliciano et al.[17]

The survey of socio-demographic factors, part previously reported by Montandon et al.[26] and also in Table 1, showed that 40.8% of the elderly live without a spouse, although only 7.9% live alone and that 44.7% of the elderly live in homes where about three generations cohabit. In addition, 36.8% did not even have one year of schooling, 92% had a maximum of four years of schooling and 40.8% received only one minimum wage. The educational level has been reported as a risk factor for dementia[14] and cohabiting over several generations has also been reported by other studies involving low-income and low-education elderly people.[16,17]

Despite the low socioeconomic conditions, 48.7% considered their quality of life to be very good or good, and only 3.9% considered poor quality of life (Table 2). The feeling of well-being and quality of life are very personal criteria and often related to goals and expectations of each one and other times to the local and own conditions of the elderly. Josefsson et al.[6] in a study with Swedish elderly observed the tendency of the elderly to self-evaluate their health as good, especially the male. However, although elderly people in rural areas tend to be considered more vulnerable and at greater risk of emergency care,[24] associated to the reported low quality of life, especially if they live alone,[25] sometimes have a better quality of life compared to the elderly living in large centers.[33]

Regarding cognitive impairment, the results showed relatively low mean MMSE scores (Table 3), but considering the level of schooling, 17.1%, i.e., 13 elderly individuals were considered as possible cognitive impairment by the screening test. In the study by Feliciano et al.[17] in the elderly in a neighborhood with low socioeconomic conditions, the cognitive conditions were more alarming, showing 56.2% of these with scores representative of cognitive impairment by the MMSE and in a study with rural elderly individuals conducted by Iatraki et al.[12] 25.4% presented cognitive impairment.

In the present study (Table 3), it was verified that 92.3% of the elderly with cognitive impairment were female. Li et al.[11] observed that the number of years of formal education, rural residence, age and female gender had a significant influence on the reduction of cognitive screening scores by MMSE. Other authors have also obtained similar results regarding the female sex[12] and the low level of schooling.[12,13]

The functional impairment of the elderly is strongly related to signs of cognitive impairment and possible early signs of dementia.[8] Among the elderly evaluated in the present study, 40.8% were considered partially dependent on the Daily Life Activities and 63.7%, partially dependent on the Instrumental Activities of Daily Life; the total dependence on these was found in 1.3% of the elderly in 2.4 activities, on average, but in general, 76.3% had dependence on at least one activity of daily living. The involvement of the Daily Life Activities is more significant than the commitment of the Instrumental Activities of Daily Life, since factors other than cognition, such as motivation or perceptual, sensory and motor abilities may be important in the performance of Instrumental Activities of Daily Life.[8]

Functional impairment of the elderly should be considered one of the important geriatric syndromes that contribute to the increased risk of mortality.[15] Maximizing the functional capacity of the elderly should be an urgent goal in public health in order to promote Healthy Aging, which can be done in two different ways: building and maintaining the intrinsic capacity and allowing someone to do important things for the one with reduced functional capacity. Key opportunities for action to optimize such trajectories include aligning health systems, developing long-term care systems, creating supportive environments for the elderly, and improving measurement, monitoring, and understanding.[2]

Therefore, like the study by Ramos et al.[16] our results showed elderly people with low purchasing power, largely cohabiting in multiple generations and with a high prevalence of disabilities, which together with the cognitive decline, can lead to serious problems with the need for formal care. It is noted, however, that the cohabiting generations can provide the necessary care, characterizing family caregivers.

In a similar way to the studies by Ramos et al.[16] found 90% of the elderly with at least one chronic disease present and Feliciano et al.[17] with 74.9% of the elderly with one to five chronic diseases, in the present study this prevalence was 88.2% (Table 6). Among the diseases found, the most prevalent (37.5%) was systemic arterial hypertension, reaching 63.2% of the elderly, data similar to a study carried out in urban elderly with low socioeconomic conditions.[17] According to Kearney et al.[20] the arterial hypertension is the most common modifiable cardiovascular disease risk factor worldwide, increases with age and affects 65% of individuals 70 years and older. In the present study, the elderly were between 60 and 91 years old.

Among the drugs ingested, 71.7% routinely referred to general cardiovascular disease control (Table 7), which may include several associations, including the use of antiplatelet agents, anticoagulants or diuretics. Thus, a high prevalence of cardiovascular diseases was observed in the studied population, being 75% of the elderly.

Comorbidities such as cardiovascular diseases, diabetes and cognitive impairment may have a significant influence on the fact that an elderly person becomes dependent on home care,[18,19] with a great impact on public health[3] and in the occurrence of mortality.[22,23] Therefore, we must consider the importance of controlling cardiovascular diseases to reduce morbidity and mortality of affected elderly; in this study all the elderly reported doing medical treatment at the local health centre.

Hypertension, smoking, and diabetes (Table 6) are high-risk factors for cardiovascular disease mortality.[22] In addition, diabetes, depressive symptoms, pain level and lower level of schooling are among the factors that may contribute to the elderly becoming homebound.[18]

Depression emerges as a risk factor for cardiovascular disease and the association between such conditions worsens health conditions and has a major impact on public health. Such a situation has not yet been fully recognized in clinical settings, but under the biopsychosocial model, early identification and rational intervention of depression contributes to improve quality of life, increase life expectancy, and reduce medical costs.[3]

The present study did not aim to investigate indicators of depression among the elderly nor to make associations between the indicators, although the high prevalence of cardiovascular alterations and the social conditions rose here point to the need for further studies and monitoring of the present population in this question. In a previous study conducted in the same population group by Montandon

et al.[26] precarious oral health conditions with a high prevalence of mucosal lesions, few teeth present and a high need for prosthetics were observed, being this population highly vulnerable and in need of government programs, according to the authors.

The social and health conditions found in the studied population should be considered in the provision of multidisciplinary health care and care behavior should be specific to the cognitive and functional limitations of the elderly considering also the present illnesses and drugs ingested. Although the increasing number of elderly individuals with chronic diseases and associated disabilities have an impact on the provision of informal care and in the health system,[16] we must consider that the diversity of the elderly population needs a change of understanding so that inequalities, but always with the need to find adequate forms of identification, monitoring and intervention, with the view that resources applied in health should be considered investments in the well-being of older individuals,[2] promoting equity in health and care.[6]

Conclusion

The population evaluated had low economic conditions, with tendency to cohabitation in several generations, but rarely evaluating their quality of life as bad. Arterial hypertension was the condition that most frequently affected the elderly, being the majority of patients with chronic disease and regular use of medications. It was also observed that almost 20% of the elderly had cognitive impairment and 76.3% had dependence on at least one activity of daily life, which can impact the provision of home care by the family. A broader approach to social and health conditions may contribute substantially to family education and training in elder care, periodic medical follow-up, and provision of specific care.[34]

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None.

Conflict of interests

Authors declare that there is no conflict of interest

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