

Predictors for the functional incapacity of the elderly in primary health care

Fatores preditores para incapacidade funcional de idosos atendidos na atenção básica

Factores predictores para la incapacidad funcional de adultos mayores atendidos en la atención básica

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ABSTRACT

Objectives: to assess the predictors for the functional incapacity of the elderly in primary health care. **Method:** cross-sectional study, of which 388 older people participated, conducted in three Primary health care Units, using the Katz index and Lawton's scale. The research project was approved by the Research Ethics Committee. **Results:** regarding the degree of dependency for Basic Activities, 90.2% were less independent for dressing themselves; and for Instrumental Activities, 77.1% of the elderly were less independent for doing handwork. The functional incapacity for basic activities was associated with age and color; for instrumental activities, with age, education, income of the elderly and self-assessment of health. **Conclusion:** attention should be paid to the overall assessment of the elderly person, in order to tailor care plans geared towards the preservation of their autonomy and the promotion of active ageing. **Descriptors:** Primary Health Care; Elderly; Health of the Elderly, Daily Activities, Nursing.

RESUMO

Objetivos: avaliar os fatores preditores para incapacidade funcional de idosos atendidos na atenção básica. **Método:** estudo transversal, do qual participaram 388 idosos, realizado em três Unidades Básicas de Saúde, utilizando-se o Índice de Katz e a escala de Lawton. O projeto de pesquisa foi aprovado pelo Comitê de Ética em Pesquisa. **Resultados:** Quanto ao grau de dependência para Atividades Básicas, 90,2% eram menos independentes para vestir-se; e para as Atividades Instrumentais, 77,1% dos idosos foram menos independentes para fazer trabalhos manuais. A incapacidade funcional para atividades básicas esteve associada à idade e à cor; as atividades instrumentais, à idade, à escolaridade, à renda do idoso e à autoavaliação de saúde. **Conclusão:** deve-se atentar para a avaliação global da pessoa idosa, com vistas a adequar planos de cuidados voltados para a preservação da autonomia dos idosos e para a promoção do envelhecimento ativo. **Descritores:** Atenção Primária à Saúde; Idoso; Saúde do Idoso, Atividades Cotidianas, Enfermagem.

RESUMEN

Objetivos: valorar los factores predictores para la incapacidad funcional de adultos mayores atendidos en la atención básica. **Método:** estudio transversal, del cual han participado 388 adultos mayores, llevado a cabo en tres unidades de atención básica de salud, empleando el índice de Katz y la escala de Lawton. El proyecto de investigación ha sido aprobado por el Comité de Ética en Investigación brasileño. **Resultados:** En relación al grado de dependencia para sus actividades básicas, un 90,2% de los adultos mayores eran menos independientes para vestirse; y para las actividades instrumentales, un 77,1% eran menos independientes para los trabajos manuales. La incapacidad funcional para las actividades básicas está asociada con la edad y etnia; y la de las actividades instrumentales con la edad, nivel de instrucción, renta y autovaloración de la salud del adulto

mayor. **Conclusión:** la valoración del adulto mayor debe ser llevada en consideración, con el fin de adecuar los cuidados dirigidos a la mantención de su autonomía y promoción del envejecimiento activo.

Descriptores: Atención Primaria a la Salud; Adulto Mayor; Salud del Adulto Mayor, Actividades Cotidianas, Enfermería.

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INTRODUCTION

The demographic phenomenon of increased life expectancy has sparked debates on aging. Estimates indicate that, in 2050, there will be in the world about 2 billion older people, i.e., people with 60 years of age or more, and that the majority will be concentrated in developing countries, like Brazil⁽¹⁾.

This phenomenon is considered one of the greatest challenges to Public Health, especially in developing countries where the demographic transition occurred abruptly, without time for a social reorganization and developing of appropriate services to meet the new demand⁽²⁾.

With the increase in life expectancy, there was a growth of the risk factors associated with chronic degenerative diseases, which tend to compromise, significantly, the quality of life of older people. Such illnesses may be responsible for the process through which a certain condition affects the functionality of older people and, consequently, the performance of everyday activities, what is known as "functional impairment"⁽³⁾.

The investigation of functional capacity is one of the major markers for the health of the elderly and has been emerging as key component for the evaluation of the health of this population. The concept of functional capacity arises from this, i.e., the ability to maintain physical and mental abilities for an independent and autonomous life. It is a concept which, from the point of view of public health, is the one best suited to instrumentalize and operationalize the health care of the elderly⁽⁴⁾.

The decline of functional capacity may be related with a series of multidimensional factors, which interact with each other and define this ability in the elderly, and the early identification of these factors can assist in the prevention of functional dependency in this group⁽³⁻⁴⁾.

It is of paramount importance to identify the functional capacity of the elderly, as well as to relate it with environmental conditions, to then investigate which may be subject to interventions. The knowledge gained may become a subside for the implementation of programs, planning of strategies and appropriate interventions to the reality of the country⁽⁵⁻⁶⁾. On light of the above, the present study aimed to evaluate the predictive factors to the functional incapacity of the elderly in primary health care.

METHOD

Ethical aspects

This study was submitted to and approved by the Standing Human Research Ethics Committee of the Federal University of Piauí, in accordance with resolution 466/12 of the National Health Council. The interviews were held in compliance with the ethical criteria and the confidentiality standard.

Study design, location and period

Cross-sectional study, carried out in three Brazilian Primary Healthcare Units (UBS) of Teresina (PI), Brazil. In Teresina, the Family Health Strategy currently has a coverage of approximately 86% of the population, with 191,938 registered families, serving 720,785 individuals, and, of these, 80,766 are elderly⁽⁷⁾.

Population or sample

The participants of the study were 388 elderly persons selected through a process of systematic random sampling from a universe of approximately 80000 older people. The inclusion criteria adopted were: age equal to or older than 60 years; residing in the area covered by the project; being registered in the Family Health Strategy; and to accept participating in the research.

Study protocol

The data were collected in the months from June to November 2013, through individual interviews with the elderly in their residence, in a private place, and guided by a form with questions addressing demographic data and health issues. The functional capacity of the elderly for Basic Activities of Daily Living (BADLs) was assessed through the Katz Index, which assesses the capacity for six basic activities, namely: bathing, dressing, going to the bathroom, transferring from a chair to a bed and vice versa, control of the sphincters and feeding themselves. In what concerns the functional capacity for Instrumental Activities of Daily Living (IADLs), Lawton's scale was used to evaluate the tasks: using the phone, shopping, preparing meals, housekeeping, using transportations, using medicines and managing money. The interviews had an average duration of 20 minutes.

Statistical analysis

The collected data were processed in the software Statistical Package for the Social Sciences (SPSS) version 18.0, using the Kolmogorov-Smirnov test and Spearman's rank correlation coefficient. For comparison of the means of the BADLs and IADLs according to the categories of the dichotomous qualitative variables, the Mann-Whitney test was used; and, for comparison of the means between qualitative variables with three or more categories, the Kruskal-Wallis test was used with Dunn's *post hoc* test.

For the multiple linear regression analysis, the variables were reclassified. In the crude analysis, Chi-square tests were employed for heterogeneity or linear trend, considering as statistically significant values of $p \leq 0.05$.

In the adjusted analysis Poisson regression was used with robust variance, being respected the hierarchy between the possible factors associated with the outcome. To facilitate the

analysis and conducting of the statistical tests, functional incapacity both for the BADLs and for the IADLs was defined as the need for partial or complete assistance in at least one of the daily activities investigated. Thus, the Katz and Lawton indexes were dichotomized in zero (independent for all activities) and 1 (dependent for one or more activities).

RESULTS

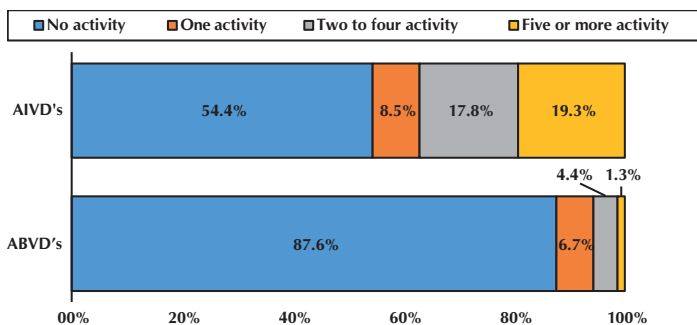
The population of the study consisted of 250 women (64.4%) and 138 men (35.6%), with ages ranging from 60 to 97 years old, average of 71 (8.2). Most of the elderly (206; 53.1%) were married or in a stable union, from the countryside region of the state (68.6%), never studied or for 4 years only (63.2%); *pardos* (60.1%) and Catholic (75.3%). Most lived with other people (91.8%), were retired (71.1%), with individual income of up to two minimum wages (84.3%).

Among the BADLs, the lowest proportion of independence was seen in dressing themselves, with 350 (90.2%) elderly persons. Regarding the IADLs, 269 (69.3%) of the elderly were less independent to get around, do handwork, wash and iron clothes (77.1%).

Using the definition of functional incapacity as need for partial or complete assistance in at least one activity, the prevalence of incapacity for BADLs was 12.4% (n = 48; 95% confidence interval - 95%CI: 9.1 – 15.7); and, for the IADLs, 45.6% (n = 177; 95%CI: 40,6–50,6) (Figure 1).

It was observed that there were no significant differences concerning gender, origin, religion and who they lived with. There was association with functional incapacity both for the BADLs and the IADLs (p < 0,001), in the schooling and age variables.

The variable marital status had significant association only for functional incapacity for BADLs (p = 0.021), like what was observed for the variable color, which had the same outcome (p = 0.025) (Table 1).



Note: IADLs: Instrumental Activities of Daily Living; BADLs: Basic Activities of Daily Living.

Figure 1 – Frequency of activities with inability for the Instrumental and Basic domains of Daily Living in the elderly in Primary health care

Table 1 - Association between the socioeconomic and demographic profile and functional incapacity for Basic (BADLs) and Instrumental (IADLs) Activities of Daily Living of the elderly who participated in the research (N = 388), Teresina, Piauí, Brazil, 2013

Variables	Total n	Functional incapacity					
		BADLs			IADLs		
		n	%	p value*	n	%	p value*
Gender				0.322			0.400
Male	138	14	29.2		59	33.3	
Female	250	34	70.8		118	66.7	
Age group, years				<0.001			<0.001
60-70	196	10	20.8		54	30.5	
70-80	120	9	18.8		62	35.0	
≥ 80	72	29	60.4		61	34.5	
Schooling				0.001			< 0.001
No schooling	133	27	56.2		87	49.2	
With schooling	255	21	43.8		90	50.8	
Marital status				0.021			0.310
No partner	182	30	62.5		88	49.7	
With partner	206	18	37.5		89	50.3	
Origin				0.222			0.471
Capital	66	04	8.3		26	14.7	
Countryside of the State	266	37	77.1		123	69.5	
Other States	56	7	14.6		28	15.8	
Color				0.025			0.619
Not white	58	43	89.5		138	78.0	
White	90	5	10.5		39	22.0	
Religion				0.141			0.030
Not Catholic	96	32	66.7		53	29.9	
Catholic	292	16	33.3		124	70.1	
Who they live with				0.982			0.336
By themselves	32	4	8.3		12	6.8	
Not by themselves	352	44	91.7		165	93.2	
Occupation				0.006			<0.001
No occupation	341	48	100.0		167	94.4	
With occupation	47	0	0.0		10	5.6	
Household income				0.023			0.002
Up to 2 MW**	191	31	64.6		102	57.6	
> 2 MW	197	17	35.4		75	42.4	
Income of the elderly person				0.002			<0.001
Up to 1 MW**	210	36	75.0		120	67.8	
> 1 MW	178	12	25.0		57	32.2	

Note: *Pearson's Chi-square Test; **at the time of research, the current MW was 678.00 R\$; MW = minimum wage; IADLs = Instrumental Activities of Daily Living; BADLs = Basic Activities of Daily Living.

Table 2 – Crude and adjusted analysis of functional incapacity for the Basic Activities of Daily Living (BADLs) according to independent variables (N = 388), Teresina, Piauí, Brazil, 2013

	PR _{crude}	95%CI	p value*	PR _{adjusted}	95%CI	p value**
Age group, years			< 0.001			< 0.001***
60-70	ref.			ref.		
70-80	0.92	0.86-0.99		1.32	0.56-3.13	
≥ 80	1.57	1.30-19.1		6.05	2.94-12.46	
Schooling			0.001			0.361
No schooling	ref.			ref.		
With schooling	0.87	0.79-0.95		0.77	0.45-1.34	
Marital status			0.021			0.162
No partner	ref.			ref.		
With partner	0.92	0.85-0.99		0.65	0.36-1.19	
Color			0.025			0.029
White	ref.			ref.		
Not White	1.10	1.03-1.18		2.58	1.10-6.05	
Religion			0.141			0.328
Not Catholic	ref.			ref.		
Catholic	0.94	0.85-1.03		0.76	0.43-1.32	
Household income, MW ****			0.023			0.520
Up to 2	ref.			ref.		
> 2	0.92	0.85-0.99		1.26	0.62-2.56	
Income of the elderly person, MW ****			0.002			0.172
Up to 1	ref.			ref.		
> 1	0.89	0.83-0.96		0.63	0.32-1.23	
Alcoholic			0.123			0.629
No	ref.			ref.		
Yes	0.91	0.84-1.00		0.75	0.23-2.41	
Smoker			0.123			0.502
No	ref.			ref.		
Yes	0.91	0.84-1.00		0.64	0.17-2.36	
Sleep and rest			0.046			0.169
Non-restorative/Insomnia	ref.			ref.		
Restorative	0.92	0.85-0.99		0.70	0.43-1.15	

Note: *Pearson's Chi-square Test; **Wald test of heterogeneity; ***Wald test of linear trend; ****at the time of research, the current MW was 678.00 R\$; MW = minimum wage; PR_{crude} = crude prevalence ratio non-adjusted variables - bivariate analysis; 95%CI = confidence interval of 95%; PR_{adjusted} = adjusted prevalence ratio - variables adjusted amongst themselves; MW = minimum wage.

Table 3 – Crude and adjusted analysis of functional incapacity for the Basic Activities of Daily Living (BADLs) according to independent variables (N = 388), Teresina, Piauí, Brazil, 2013

	RP _{crude}	95%CI	p value*	RP _{adjusted}	95%CI	p value**
Age group, years			< 0.001			< 0.001***
60-70	ref.			ref.		
70-80	1.18	0.96-1.46		1.68	1.29-2.20	
≥ 80	4.14	2.39-7.18		2.38	1.85-3.06	
Schooling			< 0.001			< 0.001
No schooling	ref.			ref.		
With schooling	0.53	0.42-0.69		0.68	0.57-0.84	
Religion			0.030			0.288
Not Catholic	ref.			ref.		
Catholic	0.78	0.61-0.99		0.90	0.73-1.10	
Occupation			< 0.001			0.181
No occupation	ref.			ref.		
With occupation	0.65	0.54-0.78		0.68	0.39-1.20	

To be continued

When comparing the habits, lifestyle, self-assessment of health and comorbidities of the elderly with functional incapacity, it was found that there was no significant difference with the smoking, physical activity and comorbidities variables. The variables that showed statistically significant difference are listed in Table 2.

In the analysis of functional incapacity for the IADLs, age group, schooling, religion, occupation, family and individual income, alcoholism, sleep and rest and self-assessment of health were the variables that had the highest risk of the outcome, as described in Table 3.

DISCUSSION

Feminization in old age is evidenced in this study and seems to be a reflection of the demographic composition of the elderly with a higher probability of survival for women, who still pay more attention to health and self-care than elderly men. The elderly, in their home environment, usually reside with spouses and children, or with spouse, children and grandchildren, the so-called “multi-generational arrangement”, which has become common in Brazil⁽⁸⁾.

A characteristic feature of old age in developing or underdeveloped countries is the high proportion of older people who lead a sedentary lifestyle, still associated with the image of the elderly as being dependent and isolated. Despite the limitations of age, the engagement of these elderly people in educational activities must be promoted. Regarding the self-assessment of health, this study demonstrated a predominance of

Table 3 (concluded)

	RP _{crude}	95%CI	p value*	PR _{adjusted}	95%CI	p value**
Household income, MW ****			0.002			0.817
Up to 2	ref.			ref.		
> 2	0.75	0.62-0.91		0.98	0.78-1.21	
Income of the elderly person, MW ****			<0.001			0.028
Up to 1	ref.			ref.		
> 1	0.63	0.52-0.76		0.77	0.61-0.97	
Alcoholic			<0.001			0.107
No	ref.			ref.		
Yes	0.64	0.53-0.77		0.60	0.33-1.12	
Sleep and rest			0.020			0.347
Non-restorative/Insomnia	ref.			ref.		
Restorative	0.80	0.65-0.97		0.91	0.75-1.11	
Self-assessment of health condition			0.003			0.021***
Very bad/weak	1.07	0.88-1.30		0.94	0.75-1.18	
Neither good, nor bad	0.76	0.63-0.90		0.73	0.57-0.92	
Very good/good			0.197			
With morbidities	ref.			ref.		
Without morbidities	1.13	0.94-1.36		1.13	0.92-1.40	0.236

Note: *Pearson's Chi-square Test; **Wald test of heterogeneity; ***Wald test of linear trend; ****at the time of research, the current MW was 678.00 R\$; MW = minimum wage; PR_{crude} = crude prevalence ratio non-adjusted variables - bivariate analysis; 95%CI = confidence interval of 95%; PR_{adjusted} = adjusted prevalence ratio - variables adjusted amongst themselves.

older people characterizing their health as "neither good nor bad", following the example of other studies⁽⁹⁾.

Regarding the degree of dependency for the BADLs, it was noted that dressing, bathing and continence were the activities which the elderly had the least independence to perform. Nevertheless, some of these activities, such as dressing and bathing, may be considered a complex activity, requiring a lot of coordination, dexterity, balance, range of motion and muscle strength.

The "continence" BADL may be associated with the aging process itself, since the genitourinary system changes over time, mainly organs such as the bladder, which undergoes changes between the striated and smooth muscles, and may cause urinary incontinence⁽¹⁰⁾.

As for the IADLs, the elderly had the least independence to get around using a means of transportation, to use the phone, to do handwork, and to wash and iron clothes. The difficulty for the use of the phone of the elderly is addressed from various aspects in the literature. It is important to note that "using the phone" should not concern the physical limitations of the senescent only. The rapid advancement in telecommunications, with constant changes in the uses of telephone services, possibly generates some level of difficulty in the performance of this task⁽¹¹⁾.

In what concerns the functional incapacity for the IADLs, it is noted that there is a tendency to it, especially for the elderly with ages older than 75 years, evidenced in several countries of Latin America⁽¹²⁾. In Brazil, this epidemiological tendency can also be noted, with marked differences between regions⁽¹³⁾.

There is a hierarchy in the functional losses, being the IADLs the first to be affected. Functional losses result in an impairment to the autonomy of the elderly, which may influence

their quality of life⁽¹⁴⁾.

The present study showed that the variables which have important association with functional incapacity, for both the BADLs and the IADLs, are age and schooling. Such findings converge with other researches that have already been carried out within national and international contexts, indicating age as a risk factor to the loss of functional capacity^(3,13). The advancement of chronological age, coupled with the aging process itself, relates directly to the higher levels of functional incapacity, there being a tendency to, with the increase of age, the chances of functional losses raising.

The other variable that remained associated with the

outcome in this study was schooling. Polls show that the higher the educational level, the lower the likelihood of the elderly reporting a worse functional capacity⁽¹⁵⁾. Education determines several advantages for health because it influences psychosocial and behavior factors. Elderly individuals with higher educational level are less likely to expose themselves to risk factors for diseases and to subject themselves to inappropriate working conditions⁽³⁾.

Elderly persons without partners have a higher tendency to functional incapacity. It is known that the state of widowhood may influence negatively the functional capacity of the elderly⁽⁶⁾. The representativeness of the variable "color" highlighted the need for reflecting on the social inequalities that pervade society, different life experiences being determined from ethnic differences, and should therefore be interpreted with caution.

The variable "occupation" could be seen as protector of the functional incapacity. The elderly who has a job is less likely to have worse functional capacity, with few difficulties for Activities of Daily Living, when compared with those who do not work⁽¹⁶⁾.

The association of low socioeconomic levels with worse health conditions has been documented, through population studies, in different age groups and in different areas^(1,4-5). The low socioeconomic condition is related with a series of negative conditions and may contribute to the loss of functional autonomy, as with low education and poor conditions of health, among other factors.

It is understood from this result that this association is due to the fact that the IADLs are more complex, and require cognition and social interactivity, which may be modified by the use of alcohol. After the adjusted analysis, the variable did not remain associated.

Sleep and rest had association with functional incapacity for both the BADLs and the IADLs, which is justified by the fact that changes in sleep and rest, caused by the aging process itself, alter the homeostatic balance, with repercussions on the psychological function, immune system, behavioral response, humor, among others⁽¹⁷⁾. After the adjusted analysis, the variable “sleep and rest” did not remain associated with the outcome.

One point worthy of attention is that, after the circumscribing of the factors associated with lower functional capacity of the elderly, it is possible to establish interventions to be made by Nursing, as well as by the multidisciplinary health team, in order to mitigate the modifiable factors related with functional capacity.

The practice of appropriate physical activity, healthy eating, abstinence from smoking and alcohol as well as using medicines wisely can prevent diseases and functional decline, increasing the longevity and quality of life of the individual, being modifiable factors that can be worked on by the multidisciplinary health team aiming at the promotion of active and healthy ageing⁽¹⁸⁾.

Limitations and contributions to the field of Nursing

This study has some limitations. It had a cross-sectional methodological design, which restricts its extensibility. Researches

with other methodological designs should be conducted in order to deepen the study on the functional losses of older people and, perhaps, interventions in order to minimize such losses.

Nursing, which is the key component of Primary Health Care, should be alert to the global assessment of the elderly person, such as the functional assessment here included, as well as the factors associated with this functionality, to tailor care plans geared towards the preservation of the autonomy of the elderly; and the promotion of active ageing.

CONCLUSION

This study evaluated the predictive factors for functional incapacity in the elderly in Primary health care, using the Katz index and Lawton's scale. Regarding the degree of dependency for Basic Activities, there was a prevalence of those who were less independent for dressing themselves; and for Instrumental Activities, the elderly were less independent for doing handwork. After the adjusted analysis, it was noted that the functional incapacity for Basic Activities was associated with age and color; and, for Instrumental Activities, with the age, education, income of the elderly and self-assessment of health variables.

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