

PHYSICAL ACTIVITY LEVEL AND FUNCTIONAL DISABILITY AMONG ELDERLY IN THE RURAL AREA OF A MUNICIPALITY IN NORTHEASTERN BRAZIL

Atividade física e incapacidade funcional em idosos da zona rural de um município do Nordeste do Brasil

Actividad física e incapacidad funcional de mayores de la zona rural de un municipio del Noreste de Brasil

Original Article

ABSTRACT

Objective: To analyze the association between the habitual physical activity and functional disability among elderly people living in rural areas. **Methods:** Cross-sectional study with 104 elderly residents in a rural area of a municipality of northeastern Brazil. The study used a questionnaire with sociodemographic and lifestyle habits information, the International Physical Activity Questionnaire (version adapted for the elderly), and the Katz scale for assessment of functional status in performing the basic activities of daily living (BADL). To assess the association between the variables of interest, the prevalence ratio (PR) and its confidence intervals were used as measure of association, and Pearson's chi-square test was performed as a measure of statistical significance, adopting $p \leq 0.05$. **Results:** The majority of the elderly were classified as insufficiently active (64.2%). Associations of statistical significance were observed between physical activity and age ($p=0.004$), marital status ($p=0.020$), and education ($p=0.002$). The physical activity practice was associated with the functional disability to perform the BADL ($p=0.017$). When stratified by age and sex, the association was not maintained ($p>0.05$). **Conclusion:** Regular practice of physical activity is evidenced as an important behavior in prevention/improvement of functional disability among the assessed elderly population.

Descriptors: Physical Activity; Aged; Rural Population.

RESUMO

Objetivo: Analisar a associação entre o nível de atividade física habitual e a incapacidade funcional de idosos residentes em áreas rurais. **Métodos:** Estudo transversal com 104 idosos residentes em uma zona rural de um município do Nordeste do Brasil. Foram utilizados um questionário com informações sociodemográficas e hábitos de vida, o questionário internacional de atividades físicas (versão adaptada para idosos) e a Escala de Katz para avaliação do estado funcional na realização das atividades básicas da vida diária (ABVD). Para avaliar a associação das variáveis de interesse, foram utilizados como medida de associação a razão de prevalência e seus respectivos intervalos de confiança, e como medida de significância estatística foi utilizado o teste qui-quadrado de Pearson, adotando $p \leq 0,05$. **Resultados:** A maioria dos idosos foi classificada como insuficientemente ativa (64,2%). Associações a níveis estatisticamente significantes foram observadas entre atividade física e idade ($p=0,004$), situação conjugal ($p=0,020$) e escolaridade ($p=0,002$). A prática de atividade física associou-se à incapacidade funcional para a realização das ABVD ($p=0,017$). Quando estratificada por sexo e idade, a associação não se manteve ($p>0,05$). **Conclusão:** A prática regular de atividade física apresenta-se como um comportamento importante na prevenção/melhora da incapacidade funcional entre a população de idosos avaliados.

Descritores: Atividade Física; Idoso; População Rural.

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RESUMEN

Objetivo: Analizar la asociación del nivel de actividad física habitual y la incapacidad funcional de mayores que viven en la zona rural. **Métodos:** Estudio transversal con 104 mayores de la zona rural de un municipio del Noreste de Brasil. Fueron utilizados un cuestionario con informaciones sociodemográficas y los hábitos de vida, el cuestionario internacional de actividades físicas (versión adaptada a los mayores) y la Escala de Katz para la evaluación del estado funcional en la realización de las actividades básicas de la vida diaria (ABVD). Fueron utilizados la razón de prevalencia y sus respectivos intervalos de confianza para evaluar la asociación de las variables de interés. Para la medición de la significación fue utilizada la prueba de Chi-cuadrado de Pearson con $p \leq 0,05$. **Resultados:** La mayoría de los mayores fue clasificada como activos insuficientes (64,2%). Se observó asociaciones estadísticamente significativas entre la actividad física y la edad ($p=0,004$), la situación conyugal ($p=0,020$) y escolaridad ($p=0,002$). La práctica de actividad física se asoció con la incapacidad funcional para la realización de las ABVD ($p=0,017$). La asociación no se mantuvo ($p>0,05$) al estratificarla por el sexo y la edad. **Conclusión:** La práctica regular de actividad física es una conducta importante en la prevención/mejoría de la incapacidad funcional de la población de mayores evaluados.

Descriptores: Actividad Motora; Anciano; Población Rural.

INTRODUCTION

The change in the epidemiological and demographic profile over recent decades has altered the age structure of the Brazilian population. Each year, 650,000 new elderly come to configure the Brazilian population and most of them are more vulnerable to chronic diseases and impairments in functional capacity⁽¹⁾. This scenario contributes to change the relation in health care and greater attention to the elderly population, with regard to actions of health promotion for these individuals.

Aging is directly related to the higher prevalence of disability and functional dependence^(2,3) and it is closely associated with reduction of weight, strength, power and muscular resistance⁽⁴⁾. Functional disability is characterized as loss of ability to perform activities that allow self-care and independent life, compromising the quality of life and the performance of daily activities⁽⁵⁾.

Besides aging, a sedentary lifestyle and/or insufficient physical activity constitute risk factors for the decline in physical fitness (cardiorespiratory and musculoskeletal) and functional capacity^(6,7).

Literature evidence shows that regular physical activity is an important protective factor against functional disability among the elderly, since it minimizes the degeneration caused by aging, due to the increasing of muscle strength, bone density, dynamic balance and global functional status⁽⁸⁻¹⁰⁾.

In this sense, physical activity is an essential part of global health promotion programs aiming at healthy aging⁽¹¹⁾. However, physical inactivity rates are still high worldwide, especially among the aged population⁽¹²⁾.

Although there is a growing number of studies directed to elder population, surveys about the association between physical activity and functional disability among older adults living in rural areas are incipient. This population has special features, such as: lower average income, lower levels of education, geographic isolation with little access to public transportation, more numerous and more severe health problems, scarce, inaccessible and more expensive health services compared to those available in the urban area. These features make rural elderly more susceptible to functional disabilities⁽¹³⁾.

In contrast, older people from rural areas have advantages compared to their urban peers as healthier lifestyle, with less consumption of tobacco^(14,15), greater incorporation of active behavior in daily activities (agricultural, gardening, hiking and fishing activities)⁽¹⁶⁾ and healthier eating habits. In this sense, the study aimed to analyze the association between the level of habitual physical activity and functional disability of elderly residents in rural areas.

METHODS

Cross-sectional study in Itajuru district, rural municipality of Jequié-BA, from August to December 2011. The municipality of Jequié is located in the southwestern state of Bahia region, with an estimated population of 151,820 inhabitants⁽¹⁷⁾.

A census was conducted among a population of 104 individuals aged 60 years or older, living in Itajuru district, who were registered in the Family Health Unit that covers the rural area of that municipality.

Individuals with diagnosis of dementia or other cognitive alterations and/or diagnosis or report of deafness that would prevent the interview were excluded. The final study population consisted of 95 individuals.

Data were collected by applying a structured questionnaire administered as an interview. The following information was included in this study: sociodemographic

characteristics (gender, age, marital status, educational level and monthly income); lifestyle habits (alcoholism and smoking, through dichotomous questions such as yes / no on the current consumption of these substances, being the consumption of these substances self-referred by the elderly); functional status (self-perception of performance in basic activities of daily living - BADL) and habitual physical activity.

For assessing the functional status, the Katz scale⁽¹⁸⁾ was used (it reflects development patterns in elderly, beginning with the most complex activities, such as dressing, bathing, to the activities of self-regulation, such as feeding, and activities of elimination or excretion), adopting scores <5 as the cutoff point for functional disability.

Habitual physical activity was evaluated by the International Physical Activity Questionnaire (IPAQ) - version adapted for the elderly⁽¹⁹⁾, an instrument that measures the weekly time spent on physical activities of moderate to vigorous intensity, in different domains. As the cutoff point, elders who exercised less than 150 minutes of moderate to vigorous activity per week in the sum of physical activities in the various domains were considered insufficiently active; and elders were considered active when practicing above that amount of time⁽²⁰⁾.

In order to evaluate the association of the variables of interest (physical activity and functional capacity), the prevalence ratio (PR) and their respective confidence intervals (CI) were used as a measure of association, and we used the chi-square Pearson test as a measure of statistical significance, adopting a significance level of $p \leq 0.05$. Data were analyzed using the software SPSS 9.0.

The study followed the Resolution 466/12 of the National Health Council, and data collection was initiated after approval by the Ethics Committee on Human Research of the State University of Southwest Bahia (Opinion No. 045/2011).

RESULTS

Among the interviewed individuals, the average age was 73.5 ± 9.4 years. There was a higher percentage of women (57.9%; $n=55$), individuals aged between 60 and 79 years (75.8%; $n=72$) with low level of education (65.3%; $n=62$), living without a partner (52.6%) and low levels of income (96.2%; $n=76$ had an income up to 1 minimum wage). Regarding behavioral characteristics, most of the interviewed did not consume alcoholic beverages (84.2% $n=80$) neither had the habit of smoking (80.5% $n=70$) (Table I).

Table I - Sociodemographic characteristics and living habits of the resident elderly population in rural area studied. Itajuru, BA, 2011.

Variable	Frequencies	
	n	%
Sex		
Female	55	57.9
Male	40	42.1
Age		
60-79	72	75.8
80 or over	23	24.2
Marital status		
Without partner	50	52.6
With partner	45	47.4
Level of education		
Literate	33	34.7
Illiterate	62	65.3
*Monthly income		
Less than one minimum wage	3	3.8
\geq One minimum wage	76	96.2
Alcoholism		
Yes	15	15.8
No	80	84.2
Tabagism		
Yes	17	19.5
No	70	80.5

*Minimum wage at the time (2011): R \$ 622.00

Table II - Association between disability and level of physical activity stratified by sex and age of the resident elderly population in the rural area studied. Itajuru, BA, 2011.

Variables	Functional disability			
	Gross PR	p value		
Not sedentary	1	0.02		
Sedentary	1.09			
	Male PR	p value	Female PR	p value
Not sedentary	1	0.316	1	0.189
Sedentary	1.09	-	1.10	-
	60-79 years old PR	p value	80 years old or over PR	p value
Not sedentary	1	0.122	1	0.293
Sedentary	1.05	-	1.16	-

PR: Prevalence ratios

Table III - Level of physical activity according to sociodemographic characteristics and lifestyle habits of elderly residents in the rural area studied. Itajuru, BA, 2011.

Variable	Level of physical activity		
	Not sedentary (%)	Sedentary (%)	p value
Sex			
Male	70.0	30.0	0.315
Female	60.0	40.0	
Age			
60-79 years old	72.2	27.8	0.004
80 years old or over	39.1	60.9	
Marital status			
With partner	75.6	24.4	0.020
Without partner	43.8	56.3	
Level of education			
Illiterate	46.8	53.2	0.002
Literate	15.2	84.8	
*Income			
Up to one minimum wage	59.2	40.8	0.156
≥ 1 minimum wage	100.0	0.0	
Alcoholism			
No	63.8	36.3	0.829
Yes	66.7	33.3	
Tabagism			
No	65.7	34.3	0.595
Yes	58.8	41.2	

* Minimum wage at the time (2011): R\$ 622,00

In the evaluation of functional capacity, it was found that 3.4% (n=3) of the elderly were dependent on others for the realization of BADL. There was association between physical activity and functional disability to perform the BADL in the gross analysis. When stratified by sex and age,

the association between physical activity and functional disability was not upheld ($p > 0.05$) (Table II).

Most elderly were physically active (64.2% n=61) and a statistically significant associations between physical activity level and age ($p=0.004$), marital status ($p=0.020$) and level of education ($p=0.002$) were observed (Table III).

DISCUSSION

The results of this study identified a high frequency of physically active individuals and a low prevalence of functional dependence. Despite the limitations of the design and size of the study sample, these findings point to the importance of physical activity among elderly population and indicates that this behavior (practice of habitual physical activity) should be part of health promotion strategies.

The high percentage of physically active seniors observed in this study contradicts the results of studies conducted with rural elderly in the city of Uberaba-MG and urban elderly from 100 municipalities in which was found a higher prevalence of sedentary elders^(21,22).

The differences in these findings may be justified by different realities and characteristics of the studied cities. In the specific case of the population of the present research, it was observed that even after retirement, most seniors still carry out their rural activities, characterized by cultivation of crops, movement through long distances in light and moderate intensities to farms, all of which seems to contribute to the reduction of physical inactivity among the investigated elderly.

In addition to physical aspects, active lifestyle adopted by the elderly regularly practicing physical activities also influences the quality of life, cognitive ability, self-esteem and social integration, allowing less dependence, greater autonomy and survival of elderly^(23,24).

Evidence indicates that the physical activity levels of individuals tend to decrease over the years^(25,12). In a study with 124 elderly aged between 80 and 100 years⁽²⁵⁾, it was noted that more than half of the elderly did not meet the minimum recommendations for practice of weekly physical activity. The main reasons for not adopting an active lifestyle are the limitations by disease, old age and lack of motivation⁽²⁶⁾. In the present study, age was one of the variables associated with decline in physical activity among participants. In this sense, it is clear that, over the years, there is a tendency of reduction of physical activity.

Other sociodemographic characteristics can influence the level of physical activity. For example, elderly without partners and with higher level of education have higher levels of physical activity^(27,28). However, in the present study, elderly with partners and with lower level of education showed highest prevalence of physical activity.

It was found that the overall prevalence of functional disability was low, a scenario that converges with results of studies conducted in Santa Catarina and Minas Gerais with rural elderly^(29,21).

The results of this study are encouraging because functional capacity tends to decline with advancing age, and can reach undesirable levels, often compromising the ability of performing daily tasks⁽³⁰⁾.

When analyzing the association between physical activity and functional disability, it was found that physical activity figured as a behavior associated with functional capacity only in the gross analysis.

Literature findings reinforce the contribution of regular physical activity to daily activities (especially BADL). One study⁽³¹⁾ demonstrated that 16 weeks of general exercises of moderate intensity is sufficient time for significant increases in functional fitness (assessed by battery of the *American Alliance for Health, Physical Education, Recreation and Dance* (AAHPERD) - composed of five tests: coordination, flexibility, strength resistance, agility and dynamic balance and general aerobic resistance) of seniors. Another study⁽³²⁾ evaluated the effect of two protocols in the performance of daily life activities in elderly women: 1) exercises with weights (performing of three series of eight to 12 repetitions at 60% of one maximum repetition in leg press exercise 45°) and 2) aerobic activity (cycle ergometer for 40 minutes at 60% heart rate reserve) at a frequency of three times a week for a period of five weeks. It was concluded that both, the exercise with weights and the aerobics, induced a positive effect on activities of daily living.

It is observed that regular practice of physical activity exerts positive effects on preventing and minimizing the deleterious effects of aging⁽³³⁾. In this context, health promotion strategies, particularly in primary health care, should encourage physical activity among the elderly, given its benefits to maintain the ability to perform daily activities.

Among the limitations of this study, we can highlight the research design. A cross-sectional study is limited to assessing the cause and effect of variables. In contrast, this study was conducted with a population little studied in Brazil, and therefore, can serve as input for the development of actions directed to this population.

Finally, it is recommended to carry out further studies with the population living in rural areas, involving larger populations and longitudinal follow-up in order to enhance our understanding of the association between physical activity and functional disability.

CONCLUSION

Regular physical activity constitutes an important behavior in preventing / improvement of functional disability among the population of elderly evaluated.

REFERENCES

1. Veras R. Envelhecimento populacional contemporâneo: demandas, desafios e inovações. Rev Saúde Pública. 2009;43(3):548-54.

2. Deschenes MR. Effects of aging on muscle fibre type and size. *Sports Med.* 2004; 34(12):809-24.
3. Doherty TJ. Invited review: aging and sarcopenia. *J Appl Physiol.* 2003;95(4):1717-27.
4. Silva TAA, Frisoli Junior A, Pinheiro MM, Szejnfeld VL. Sarcopenia associada ao envelhecimento: aspectos etiológicos e opções terapêuticas. *Rev Bras Reumatol.* 2006;46(6):391-7.
5. Minosso JSM, Amendola F, Alvarenga MRM, Oliveira MAC. Prevalência de incapacidade funcional e dependência em idosos atendidos em um centro de saúde-escola da universidade de São Paulo. *Cogitare Enferm.* 2010;15(1):12-8.
6. Caldas CP. Envelhecimento com dependência: responsabilidades e demandas da família. *Cad Saúde Pública.* 2003;19(3):733-81.
7. Christensen U, Stovring N, Schultz-Larsen K, Schroll M, Avlund K. Functional ability at age 75: is there an impact of physical inactivity from middle age to early old age? *Scand J Med Sci Sports.* 2006;16(4):245-51.
8. Okuma SS. O idoso e a atividade física: fundamentos e pesquisa. 3ª ed. São Paulo: Papirus; 2004.
9. Virtuoso Junior JS, Tribess S, Paulo, TRS, Martins CA, Romo-Perez V. Atividade física como indicador preditivo para incapacidade funcional em pessoas idosas. *Rev Latinoam Enferm.* 2012;20(2):1-7.
10. Penha JCL, Piçarro IC, Barros Neto TL. Evolução da aptidão física e capacidade funcional de mulheres ativas acima de 50 anos de idade de acordo com a idade cronológica, na cidade de Santos. *Ciênc Saúde Coletiva.* 2012;17(1):245-53.
11. Matsudo SM. Atividade física na promoção da saúde e qualidade de vida no envelhecimento. *Rev Bras Educ Fís Esp.* 2006;20(Supl 5):135-7.
12. Hallal PC, Andersen LB, Bull FC, Guthold R, Haskell W, Ekelund U. Global physical activity levels: surveillance progress, pitfalls, and prospects. *Lancet.* 2012;380(9838):247-57.
13. Alencar NA, Aragão JCB, Ferreira MA, Dantas EHM. Avaliação da qualidade de vida em idosas residentes em ambientes urbano e rural. Rio de Janeiro. *Rev Bras Geriatr Gerontol.* 2010;13(1):103-9.
14. Knuth AG, Bacchieri G, Victora CG, Hallal PC. Changes in physical activity among Brazilian adults over a 5-year period. *J Epidemiol Community Health.* 2010;64(7):591-5.
15. Knuth AG, Hallal PC. Temporal trends in physical activity: a systematic review. *J Phys Act Health.* 2009;6(5):548-59.
16. Ogilvie D, Foster CE, Rothnie H, Cavill N, Hamilton V, Fitzsimons CF, et al. Interventions to promote walking: systematic review. *BMJ.* 2007;334:1204.
17. Instituto Brasileiro de Geografia e Estatística - IBGE. Censo demográfico. Características da população e dos domicílios: resultados do universo. Rio de Janeiro: IBGE; 2010.
18. Katz S, Stroud MW. Functional assessment in geriatrics: a review of progress and directions. *J Am Geriatr Soc.* 1989;37(3):267-71.
19. Benedetti TRB, Borges LJ, Petroski EL, Gonçalves LHT. Atividade física e estado de saúde mental de idosos. *Rev Saúde Pública.* 2008;42 (2):302-7.
20. Tavares DMS, Arduini AB, Dias FA, Ferreira PCS, Oliveira EA. Perfil sociodemográfico, capacidade funcional e qualidade de vida de homens idosos residentes na zona rural. *Rev de enferm e atenção à saúde.* 2012;1(1):17-29.
21. Madeira MC, Siqueira FCV, Facchini LA, Silveira DS, Tomasi E, Thumé SSM, et al. Atividade física no deslocamento em adultos e idosos do Brasil: prevalências e fatores associados. *Cad Saúde Pública.* 2013;29(1):165-74.
22. Chaim J, Raimundo ME, Ferreira CAS, Yuaso DR. Prática regular de atividade física e sedentarismo: influência na qualidade de vida de idosas. *Passo Fundo. RBCEH.* 2010;7(2):198-209.
23. Rocha SV, Tribess S, Virtuoso Júnior JS. Atividade física habitual e qualidade de vida de mulheres idosas com baixa condição econômica. *Rev Educação Física UEM.* 2008; 19(1):101-8.
24. Andrade EL, Matsudo SMM, Matsudo VKR, Araújo TL, Andrade DR, Oliveira LC, et al. Barriers and motivational factors for physical activity adherence in elderly people in developing country [abstract]. *Med Sci Sports Exerc.* 2000;33(7):141.
25. Boscatto EC, Duarte MFS, Barbosa AR. Nível de atividade física e variáveis associadas em idosos longevos de Antônio Carlos, SC. Pelotas/RS. *Rev Bras Ativ Fis Saúde.* 2012;17(2):132-6.
26. Lopes MA, Krug RR, Mazo GZ, Bonetti M. Motivos de não adoção à prática de atividade física por pessoas longevas. Viçosa. *Rev Mineira Educ Fís.* 2012;1:1145-53.

27. Massa KHC, Guimarães VV, César CLG, Barros MBA, Carandina L, Goldbaum M, et al. Atividade física e hipertensão em idosos no Município de São Paulo. Pelotas/RS. Rev Bras Ativ Fis Saúde. 2012;17(1):7-13.
28. Del Duca GF, Silva MC, Hallal PC. Incapacidade funcional para atividades básicas e instrumentais da vida diária em idosos. Rev Saúde Pública. 2009;43(5):796-805.
29. Fhon JRS, Diniz MA, Leonardo KC, Kusumota L, Haas VJ, Rodrigues RAP. Síndrome de fragilidade relacionada à incapacidade funcional no idoso. Acta Paul Enferm. 2012;25(4):589-94.
30. Brown CJ, Flood KL. Mobility limitation in the older patient: a clinical review. J Am Med Assoc. 2013;310(11):1168-77.
31. Nascimento CMC, Ayan C, Cancela JM, Pereira JR, Andrade LP, Garuffi M, et al. Exercícios físicos generalizados capacidade funcional e sintomas depressivos em idosos brasileiros. Rev Bras Cineantropom Desempenho Hum. 2013;15(4):486-97.
32. Raso V, Grave JMD. Exercício aeróbico ou com pesos melhora o desempenho nas atividades da vida diária de mulheres idosas. Rev Bras Med Esporte. 2012;18(02):87-90.
33. Spirduso WW. Dimensões físicas do envelhecimento. São Paulo: Manole; 2005. p. 38-56.

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