Revista Brasileira de Enfermagem
REBEn

RESEARCH

Functional disability: health conditions and physical activity practice in older adults

Incapacidade funcional: condições de saúde e prática de atividade física em idosos

Discapacidad funcional: condiciones de salud y práctica de actividad física en ancianos

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How to cite this article:
Brito KQD, Menezes TN, Olinda RA. Functional disability: health conditions and physical activity practice in older adults. Rev Bras Enferm [Internet]. 2016;69(5):773-80. DOI: http://dx.doi.org/10.1590/0034-7167.2016690502

Submission: 05-02-2015 **Approval:** 11-15-2015

ABSTRACT

Objective: to verify the prevalence of functional disability among older adults and how it can affect their health conditions and the regular practice of physical activities. **Method:** this is a household and cross-sectional study conducted with older adults of both sexes. We verified the variables associated with functional disability by Poisson's regression. **Results:** around 420 older adults participated in this study (68.1% of them being women). We observed a statistically significant association between functional disability, the number of chronic diseases, self-assessed health conditions, and the practice of physical activities; the latter only being found among men. Older adults who reported presenting four or more chronic diseases, self-assessed their health conditions as poor, and were not used to practice physical activities, showing high prevalence of functional disability. **Conclusion:** considering the changeable character of these variables, we recommend that prevention actions be taken, mainly at primary level, to delay the emergence of disability.

Descriptors: Older adults; Weakened; Self-Assessment; Nutritional Status; Non-Communicable Disease.

RESUMO

Objetivo: verificar a prevalência de incapacidade funcional entre idosos e sua associação com condições de saúde e prática de atividade física regular. **Método:** trata-se de um estudo de base domiciliar, transversal, realizado com idosos de ambos os sexos. As variáveis associadas à incapacidade funcional foram verificadas por meio de regressão de Poisson. **Resultados:** participaram deste estudo 420 idosos (68,1% mulheres). Observou-se associação estatisticamente significativa entre incapacidade funcional e número de doenças crônicas, autoavaliação de saúde e prática de atividade física, essa última apenas entre os homens. Idosos que referiram quatro ou mais doenças crônicas, que autoavaliaram a saúde como ruim e que não praticavam atividade física, apresentaram elevadas prevalências de incapacidade funcional. **Conclusão:**considerando o caráter modificável dessas variáveis, recomendam-se ações de prevenção, principalmente em nível primário, que retardem o surgimento de incapacidades.

Descritores: Idoso; Fragilizado; Autoavaliação; Estado Nutricional; Doença Crônica.

RESUMEN

Objetivo: verificar la prevalencia de discapacidad funcional entre ancianos y su asociación a condiciones de salud y práctica regular de actividad física. **Método**: estudio de base domiciliaria, transversal, realizado con ancianos de ambos sexos. Las variables asociadas a la discapacidad funcional fueron verificadas mediante regresión de Poisson. **Resultados**: participaron del estudio 420 ancianos (68,1% mujeres). Se observó asociación estadísticamente significativa entre discapacidad funcional y número de enfermedades crónicas, autoevaluación de salud y práctica de actividad física, esta última sólo entre los hombres. Los ancianos que informaron cuatro o más enfermedades crónicas, que autoevaluaron su salud como mala y que no practicaban actividades físicas presentaron prevalencias elevadas de discapacidad funcional. **Conclusión**: considerando el carácter modificable de estas variables, se recomiendan acciones de prevención, particularmente a nivel primario, con el fin de retardar el surgimiento de discapacidades.

Descriptores: Anciano Frágil; Autoevaluación; Estado Nutricional; Enfermedad Crónica.

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INTRODUCTION

The increase in the number of older adults has been calling the attention of researchers from Brazil[1] and around the world[2] who are responsible for assessing the impacts of population aging on families, communities, and on the various sectors of society, especially the ones concerning social security and health[3]. Studies[1-5] have been evaluating the impact of aging in the life of older adults, since it is possible to note some biological, physical, psychological, and social changes along with the aging process, which could trigger several problems such as falls[4], non-communicable diseases (also known as chronic diseases)[1], nutritional changes[5], and functional disability[1-3].

In this context, the National Policy of Health for Older Adults advocates, among other things, that older adults' global assessment becomes part of the daily performance of health professionals in their health care. This assessment includes the evaluation of functional disability to promote prevention and recovery[6].

Having a functional disability means presenting difficulties when performing everyday activities, or even the inability to do them[7], which is related to higher risks of hospitalization[1], institutionalization[8], and death[9]. Considering the importance of assessing these functional disability in older adults and aiming to identify their prevalence rate, studies have been carried out in Brazil and in other countries[1-2,7-8,10-13].

A study conducted in Japan found a prevalence of 20.1% of functional disability among older adults[2]. Another study[12], carried out in Chile using the Lawton and Brody's Index, verified a prevalence of 35.0% of older adults were functionally disabled. In Brazil, a study from Minas Gerais identified that 44.6% of older adults showed some kind of degree of disability[10], while another one from the Northeastern region of Brazil identified a prevalence of 42.2% of functional disability in non-institutionalized older adults[14]. In a research with institutionalized older adults, the prevalence of disability ranged between 13.0% and 31.2%[8].

Considering the aspects related to functional disability, these studies have been verifying a high prevalence of disabled older adults who do not practice physical activities regularly[10], who present nutritional disorders[11-12,15], a high number of non-communicable diseases[1-2], and also have self-assessed their health conditions as poor[8,10,16].

Taking the aforementioned into account, there is a need to identify health profiles that, in this context, include categories such as: nutritional status, number of non-communicable diseases, how these individuals self-assess their health, as well as the presence of functional disability, with the objective of stablishing which ones should be seen as priorities regarding prevention and intervention. Hence, this study aims to verify the prevalence of functional disability among older adults and its association with health conditions and the regular practice of physical activities.

METHOD

Ethical aspects

This research was approved by the Research Ethics Committee of the State University of Paraíba. Older adults who have agreed to participate in this research have signed an Informed Consent Form; we informed them on the main objectives of the study, the type of participation desired, and also on the fact they could give up on participating at any moment if they wanted to. We also assured them of the anonymous and confidential character concerning the information provided.

Design, study location, and period

This is a household and cross-sectional study with primary data gathering carried out in Campina Grande, Paraíba, Brazil, from August 2009 to May 2010.

Sample – Inclusion and exclusion criteria

Participants of the study were individuals of both sexes, aged 60 years or more who were registered in the Family Health Strategy from Campina Grande. We excluded from the study older adults who presented severe clinical weakness with no therapeutic possibilities, i.e., those at terminal-stage of illness, as well as those who were absent from Campina Grande for longer than the period of the field research in the Basic Unit of Family Health (BUFH) in the area where they were registered.

We made the sample calculation by estimating a prevalence outcome of at least 25% with a confidence limit of 95%, admitting an error percentage of 6%. The sample was proportional to each Health District of the city, comprising a total of 420 older adults.

Study protocol

In each UBSF drawn, we carried out a survey to gather the number of registered older adults, which was followed by their random selection in a systematic and proportional way. We elaborated a list with the name of all registered older adults in each BUFH. We defined the number of people to be skipped until selecting the next one on the list of interviewed by analyzing the ratio between the total number of registered older adults and a determined number of older adults to be interviewed in a certain UBSF, thereby getting into the number five. This way, to each selected old adult, we skipped four others on the list. The fifth older adult was the chosen one and so on, aiming at obtaining a better distribution and ensuring the whole list would be covered.

We conducted the process of data gathering at the participants' homes with the help of three pairs of interviewers (undergraduate students of the health field adequately trained by the professor who heads this research and other professors) and carried out a pilot research with 42 older adults (10% of the total to be interviewed), for possible methodological adjustments.

In this study, we used as independent variables: regular practice of physical activities, nutritional status, number of non-communicative diseases, and self-assessment of health. These last three variables are related, in the context of this research, to individuals' health conditions.

We considered the regular practice of physical activity variable when participants reported practicing exercises at least three times a week for at least 30 minutes[17].

We verified the nutritional status according to the Body Mass Index (BMI), which comprises body weight (kg) divided

by the square of the body height (m) (W/H2). To make all measures we used a portable anthropometer. For weight measures, we used a portable digital weighing scale of platform type, with capacity for 150 kg and sensitivity of 100 g. For the BMI analysis (kg/m^2), we used a classification suggested by the Pan-American Health Organization (PAHO): underweight ($<$ 23 kg/m^2), eutrophy ($\geq$ 23 kg/m^2 and $<$ 28 kg/m^2), overweight ($\geq$ 28 kg/m^2 and $<$ 30), and obesity ($\geq$ 30 kg/m^2).

To verify the number of diseases listed, we asked the participants if a physician or other health professional have ever informed them about the possibility of they having some of the following diseases: high blood pressure, arthritis/arthritis/rheumatism, heart problems, diabetes, osteoporosis, chronic pulmonary disease, embolism/stroke, and malignant tumor.

We analyzed the participants' self-assessment according to their answers to the question: "How would you classify your health?", having answer options such as: excellent, very good, good, regular, and poor. For statistical purposes, this variable was divided into: good self-assessment of health (excellent, very good, good) and poor self-assessment of health (regular and poor).

The dependent variable was "functional disability", assessed using the Barthel Index, which comprises daily life activities such as: eating, dressing up, performing personal hygiene, putting on orthopedic device (if appliable), controlling sphincters, using the toilet, walking (in case of the person being physically disabled, this one would be replaced by "using the wheelchair"), going up and down stairs. For each activity there are three options of answer: *I can do it by myself*, *I can do it with someone's help*, and *I can't do it at all*. Each answer has a specific score that after being summed up it will be possible to reach a total value from 0 to 100 points, corresponding to patients' total dependence or total independence, respectively.

From the score, we used the following classification[18]: independent (100 points), light dependence (91 to 99 points), moderate dependence (61 to 90 points), severe dependence (21 to 60 points), and total dependence (0 to 20 points). For statistical purposes, we classified older adults as it follows: functional disability (yes, no). We considered as functional disabled the older adults classified by the Barthel index as light, moderate, severe, and total dependents, while the ones without functional disability were classified as independents.

Results analysis and statistics

We obtained the statistical informations with the help of a statistical app named R (The R Foundation for Statistical Computing, Vienna, Austria). Firstly, to verify the statistical association between the dependent variable and the independent variables, we performed a bivariate analysis with the Pearson's Chi-square test, using a level of significance of $<5\%$ with Yates' correction when necessary. Next, we estimated the prevalence ratio (PR) with the respective confidence intervals (95%CI) using Poisson's regression model with logarithmic link function, via Generalized Linear Models (GLMS).

After the bivariate analysis, we included all variables in the multivariate model. From the first model that included all variables regardless of the value of *p*, we started to withdrawn the variables one by one considering the greatest value of *p,* until only the ones with a *p* smaller than 0.05 were left.

RESULTS

The sample of this study is consisted of 420 old adults (68.1% of them being women). The age of the participants ranged between 60 and 104 years, with an average of 71.6 years (SD = 9.19).

Table 1 presents the values of the bivariate analyses of the relation between functional disability, health conditions, and the regular practice of physical activity. From the variables studied, the ones that presented a statistically significant relation with functional disability were: regular practice of physical activity (p = 0.000001033), number of non-communicable diseases (p = 0.00000232), and self-assessment of health (p = 0.0001218).

Table 1 – Results of the bivariate analysis regarding functional disability and related factors (regular practice of physical activity, nutritional status, number of non-communicable diseases, and self-assessment of health) in older adults, Campina Grande, Paraíba, Brazil, 2009–2010

Variables	n	Prevalence of functional disability (95%CI)	*p* value	PR (95%CI)
Regular practice of physical activity			**0.000001033***	
Active	14	14.7 (13.2–16.9)		1
Inactive	129	39.8 (37.2–41.7)		2.70(1.64–4.46)
Nutritional status			0.1695*	
Eutrophy	40	25.5 (24.8–27.5)		1
Underweight	28	36.4 (33.2–38.9)		1.43 (0.96–2.13)
Overweight/obesity	53	32.9 (30.1–34.4)		1.29 (0.91–1.83)
Number of NCD			**0.00000232***	
None	10	14.7 (12.9–15.8)		1
1 to 3	110	35.4 (33.2–36.6)		2.41 (1.33–4.35)
4 or more	23	57.5 (54.7–59.3)		3.91 (2.08–7.35)
Self-assessment of health conditions			**0.0001218***	
Good	30	21.4 (19.5–23.1)		1
Poor	113	40.6 (38.9–41.4)		1.91 (1.35–2.71)

*Notes: NCDs: Non-communicable Diseases; * Pearson's Chi-Square Test; PR: prevalence ratio.*

Older adults who did not practice physical activity showed prevalence 2.70 times higher for functional disability when compared to older adults who did. Older adults who mentioned four or more non-communicable diseases showed prevalence 3.91 times higher for functional disability when compared to those who did not reported having any disease. Old adults who assessed their health as poor showed prevalence of functional disability 1.91 times higher when compared to older adults who have assessed their health as good.

Table 2 presents the results of the Poisson's regression, in which it was possible to note that, after the multivariate analysis, the practice of regular physical activity lost statistical significance.

Table 3 presents the values of the bivariate analyses of the relation between functional disability, health conditions, and the regular practice of physical activity according to sex. Among men, we verified a statistically significant relation between the regular practice of physical activity (p = 0.04121), the number of non-communicable diseases (p = 0.005428), and self-assessment of health (p = 0.02006).

Men who did not practice physical activity regularly had a prevalence 1.23 times higher of being functionally disabled when compared to the ones that did. Concerning the number of non-communicable chronic diseases, older adults who reported having four or more of the diseases showed a higher prevalence (PR = 1.7; 95%CI = 0.89–3.24) of functional disability when compared to those who reported not having any of the diseases pointed out. When it comes to the variable "self-assessment of health", men who self-assessed their health as poor showed a prevalence 1.25 times higher of being functionally disabled when compared to men with a good self-assessment of health (Table 3).

Among women, we detected a statistically significant association

Table 2 – Poisson regression models. Variables associated with functional disability in older people, Campina Grande, Paraíba, Brazil, 2009–2010

	Model 1	Model 2	Model 3
Nutritional status	0.62722		
Regular practice of physical activity	0.38623	0.12041	
Number of noncommunicable diseases.	0.05128	0.01678	0.02134
Self-assessment of health conditions	0.01981	0.04981	0.03248

Table 3 – Result of the bivariate analysis regarding the functional disability and related factors (regular practice of physical activity, nutritional status, number of non communicative diseases, and self-assessment of health) among men and among women. Campina Grande, Paraíba, Brazil, 2009–2010

Variables	n	Prevalence of functional disability (95%CI)	*p* value	PR (95%CI)
Men				
Regular practice of physical activity			0.04121*	
Active	04	9.3 (6.7–11.3)		1
Inactive	24	26.4 (24.2–28.6)		1.23 (1.05–1.44)
Nutritional status			0.1718*	
Eutrophy	12	19.7 (17.7–24.4)		1
Underweight	02	6.90 (4.0–9.20)		0.86 (0.74–1.01)
Overweight/obesity	09	24.3 (22.1–26.9)		1.06 (0.85–1.32)
Number of NCD			**0.005428***	
None	01	2.9 (0.4–4.2)		1
1 to 3	24	26.1 (22.7–28.1)		1.31 (1.15–1.5)
4 or more	03	42.9 (41.2–44)		1.70 (0.89–3.24)
Self-assessment of health conditions			0.02006*	
Good	06	10.5 (8.4–12.6)		1
Poor	22	28.6 (26.8–31.9)		1.25 (1.06–1.48)
Women				
Regular practice of physical activity				
Active	10	19.2 (16.8–22.1)	**0.001049***	1
Inactive	105	45,1 (42.0–47.5)		1.47 (1.23–1.75)
Nutritional status			0.01266*	
Eutrophy	28	29.2 (26.8–30.9)		1
Underweight	26	54.2 (51.6–56.3)		1.55 (1.11–2.16)
Overweight/obesity	44	35.5 (33.3–38.8)		1.10 (0.91–1.32)
Number of NCD			0.01763*	
None	09	27.3 (24.4–28.9)		1
1 to 3	86	39.3 (37.9–41.3)		1.20 (0.95–1.51)
4 or more	20	60.6 (57.6–62.7)		1.85 (1.15–2.96)
Self-assessment of health conditions			0.01285*	
Good	24	28.6 (26.4–30.8)		1
Poor	91	45.3 (42.3–46.9)		1.31 (1.09–1.57)

*Notes: NCDs: Non-communicable Diseases; * Pearson's Chi-Square Test; PR: prevalence ratio.*

between all variables studied and functional disability. Older women who did not practice physical activity regularly showed a prevalence 1.47 higher of being functionally disabled when compared to active older women. Those underweight (PR = 1.55; 95%CI = 1.11–2.16) and overweight/obese (PR = 1.1; 95%CI = 0.91–1.31) women showed higher prevalence of being functionally disabled when compared to eutrophic ones. Older women who reported having 1 to 3 or 4 and more diseases showed higher prevalence (PR = 1.2; 95%CI = 1.51 and PR = 0.95 – 1.85; 95%CI = 1.15–2.96, respectively) of being functionally disabled when compared to those who reported not having any of the diseases pointed out. Older women who assessed their health as poor showed prevalence 1.31 times higher of being functionally disabled when compared to older adults who have assessed their health as good.

Table 4 shows the results of Poisson's regressions for men and women. Among men, it is possible to verify that the variables "nutritional status" and "self-assessment" of health lost statistical significance. Hence, only the variables "practice of regular physical activity" and "number of chronic non-communicable diseases" remained in the final model (Model 3).

Among women, variables such as "regular practice of physical activity", "nutritional status" and "self-assessment of health" lost statistical significance, the variable "number of non-communicable diseases" being the only one remaining in the final model (Model 4).

In Table 5, we present the final result, after its adjustment, both for the total group of older adults as for the group comprising only men and the other comprising only women.

After the adjusted multivariate analysis, for the total of older adults, a poor self-assessment of health ended up being associated with the highest prevalence of functional disability (PR = 1.53; IC = 1.04-2.25) when compared to the older adults who self-assessed their health as good. The presence of one to three NCDs increased the prevalence of disability in 2.08 times. When participants have four or more diseases, this percentage increased to 3.12 times when compared to the group of older adults that did not report having any disease. Among men, prevalences associated with one to three (PR = 5.83; 95%CI = 1.39-24.52) and four or more NCDs (PR = 7.80; 95%CI = 1.30-46.67) increased. Men who did not practiced physical activity showed a prevalence 2.37 times higher when compared to the ones who did. Among women, those who reported having one to three NCDs (PR = 1.32; 95%CI

Table 4 – Poisson's regression models Variables associated with functional disability in men and women, Campina Grande, Paraíba, Brazil, 2009–2010

	Men			
	Model 1	**Model 2**	**Model 3**	
Nutritional status	0.8383			
Self-assessment of health conditions	0.1995	0.4123		
Regular practice of physical activity	0.1338	0.0746	0.0562	
Number of NCD	0.1373	0.0433	0.0245	
Women				
	Model 1	**Model 2**	**Model 3**	**Model 4**
Regular practice of physical activity	0.9877			
Nutritional status	0.5306	0.5287		
Self-assessment of health conditions	0.0833	0.0818	0.1460	
Number of NCD	0.3026	0.3019	0.0454	0.0334

Note: NCDs: Non-communicable Diseases.

Table 5 – Final result (gross and adjusted multivariate analysis) regarding functional disability and socioeconomic and demographic related factors, Campina Grande, Paraíba, Brazil, 2009-2010

Variables	n	Gross PR	95%CI	Adjusted PR	95%CI
Total					
Self-assessment of health conditions					
Good	30	1		1	
Poor	113	1.72	1.18–2.53	1.53	1.04–2.25
Number of NCD					
None	10	1		1	
1 to 3	110	2.29	1.23–4.24	2.08	1.11–3.88
4 or more	23	3.62	1.77–7.39	3.12	1.51–6.44
Men					
Regular practice of physical activity					
Active	04	1		1	
Inactive	24	2.13	0.88–5.15	2.37	0.98–5.57
Number of NCD					
None	01	1		1	
1 to 3	24	5.33	1.27–22.36	5.83	1.39–24.52
4 or more	03	7.50	1.25–44.88	7.80	1.3–46.67
Women					
Number of NCD					
None	09	1		1	
1 to 3	86	1.51	0.76–2.99	1.32	0.53–2.47
4 or more	20	2.33	1.07–5.09	2.26	1.03–4.09

Note: NCDs: noncommunicable diseases; PR: prevalence ratio.

= 0.53-2.47) and those who mentioned four or more (PR = 2.26; 95%CI = 1.03-4.09) showed higher prevalence for functional disability when compared to those who reported no chronic conditions.

DISCUSSION

Functional disability exert an important influence on the quality of life of older adults, being determined by several factors among which we can mention those concerning health conditions[11,16] and the practice of physical activity[19]. The association of these factors with functional disability has been investigated in different studies[1,8,10-11,16,19-22]. From the health-related variables we have: nutritional status[11,21], the number of non-communicable diseases[1,6], self-assessment of health[8,13,16], and regular practice of physical activity[19-20,22].

In this study, the only variable that showed no significant statistical association with functional disability, both for the total group of older adults as for men, was "nutritional status". However, we have to consider the high prevalence of older adults who had inappropriate nutritional status either by being underweight or overweight/obese.

A research conducted in Pernambuco verified that most overweighted older adults presented functional disability[11]. Another study, carried out in Chile, concluded that underweight among older adults is associated with the presence of functional disability[12]. With that, we observed an inadequate nutritional status has an important association with functional disability. A concerning factor considering the high prevalence of older adults with an inadequate nutritional status, as observed in several studies[1,23-24]. This nutritional inadequacy, caused by a deficiency of calories and nutrients or by the excess of calories interferes in the welfare of older adults and can lead to functional decline[11]. Therefore, cooperation measures for the maintenance of an appropriate weight in older adults should always be encouraged.

In this study, we verified the highest prevalence of functional disability among older adults who did not practice physical activity, had a inadequate nutritional state, had reported having four or more diseases, and had self-assessed their health as poor, when considering the total group of older adults and the ones for men and women, separately.

Regarding the practice of physical activity, the present study found a high prevalence of functional disability among older adults who did not practice physical activity, both in the total group of older adults as for the ones only for men and women. These data corroborate with the findings of other studies[20,22-23].

In a research conducted in the state of Goiás, Brazil, the prevalence of functional disability observed was higher among older adults who did not practice physical activity than in older adults who did[19]. However, to better explain this association, it would be necessary to keep up with these older adults to establish the cause of these phenomena, since it is possible that physical inactivity be associated with a prior functional disability condition.

Physical activity enables individuals to get physically conditioned, making them capable of performing daily life activities throughout life[23]. In this sense, encouraging the regular practice of physical activity is essential at all stages of life, because its benefits are unquestionable in the prevention of diseases, and in the promotion of health and quality of life[10]. Older adults who have this habit must be encouraged to continue exercising and those who live a sedentary lifestyle should be aware of the need to start doing some kind of activity so that they can minimize the negative effects of physical inactivity.

From all the variables studied, the one that showed the highest values of prevalence ratio was "number of non-communicable diseases", and we observed the highest prevalences among older adults who reported four or more non-communicable diseases, both in the total group of older adults as in the ones only for men and only for women. These data corroborate with the findings of other studies that have shown a association between number of non-communicable diseases and functional disability[1,10]. A study conducted with older adults registered in a health insurance plan found that participants who reported four or more diseases had higher prevalence of being functionally disabled when compared to those who reported having only one disease[24].

Data from the Brazilian National Household Survey of 2008, showed high prevalence of older adults in Brazil that had some non-communicable diseases[25]. Whereas the association between chronic diseases and functional incapacity is confirmed by literature, the necessity of adopting effective measures for the prevention and health promotion, reducing the crippling impacts of that event[26]. This measures must be focused on contributing to the natural history of the disease in a favorable way, and delay its evolution and complications, which might reflect on the maintenance and improvement of functional capacity. Taking this into account, health professionals need to be prepared to previously detect non-communicable diseases, monitor and direct appropriate interventions, considering the particularities of this population.

The association between the self-assessment of health and functional disability has been commonly studied[8,10,13,26]. In the present study, poor self-assessments of health were associated with high prevalence of disability, both in the total group of older adults and the ones for men and women, separately. A study carried out in the state of Mato Grosso, Brazil, found that, most older adults who self-assessed their health as poor presented functional incapacity, whereas the prevalence among those with good health self-assessment was a little more than one third[8].

The self-assessment of health reflects the individual's perception about the biological, social and psychosocial dimension[10], therefore it must be considered during older adults care, mainly when it is wished to verify factors related to functional disability. It is likely that older adults who feature functional disability not assess their health condition so well[8], which can contribute to the worsening of such condition.

After the multivariate analysis, the variables that remained associated with functional disability were: the number of NCDs, both for the total group of older adults as for the ones only for men and only for women; the self-assessment of health for the total group of older adults; and the regular practice of physical activity for men. As seen previously, these variables are of changeable character, inclined to be postponed, as it is

the case of the NCD's, which enables the development of effective interventions aimed at preserving functional capacity.

As an example, we can mention a longitudinal study conducted with older women that found that, after the implementation of physical exercises during five weeks, it was possible to note an improvement in the performance of daily life activities[20]. Considering physical inactivity is a changeable factor, it is necessary to encourage older adults to get some exercise and choose public and safe spaces, preferably with professional supervision, to work out.

Regarding non-communicable diseases, the main risk factors for its development are: tobacco use, unhealthy eating habits, physical inactivity, and harmful consumption of alcohol[27] These variables need to be considered in programmes of prevention of such diseases.

The self-assessment of health reflects the perception of individuals about their own health[28] and consists of a variable that made of subjective features, although it can be compared to objective measures of health[29]. A study conducted in Campinas, São Paulo, concluded the self-assessment of health is associated with factors such as practice of physical activity, adequate nutritional status, and consumption of fruits and vegetables four times or more per week[30]. This shows that changes in these aspects may contribute to a positive self-assessment of older adults about their health.

Now it is appropriate to state that these variables are contained in a multifactorial network associated with functional disability in older adults. This network present factors mainly related to a healthy lifestyle, and its prevention necessarily undergoes changes in behavior.

On one hand, at the moment individuals decide to adopt habits such as healthy eating, weight management, and regular practice of physical activity, they decrease the risk of problems related to physical inactivity, the chance to have a higher number of non-communicable diseases, and self-assess their health negatively, which contributes to the preservation of their functional capacity.

On the other hand, when individuals have their functional capacity preserved, they have higher possibility to maintain the practice of physical activity, control non-communicable diseases, and better assess their health. Therefore, we can state that successful aging, with preserved functional capacity, depends on, among other factors, a healthy lifestyle, namely: maintaining an adequate weight by eating a balanced diet, practicing regular physical activity, and controlling non-communicable diseases.

A limitation verified in this study is related to its transversal design, which makes it impossible to establish temporal relationships between independent variables and functional disability. However, this kind of study contributes to revealing the functional disability charge in the population of older adults and related factors, contributing to the elaboration of prevention measures to the outcome in question, as it is the case of this research.

CONCLUSION

The results of this study lead to an association between functional incapacity, the number of non-communicable diseases, and self-assessment of health, regardless of sex. Among men, there is a specific association with the practice of physical activity, while among women there is with the number of non communicative diseases. Therefore, these characteristics must be observed during the overall assessment of older adults.

To preserve the functional capacity of older adults is a great challenge to public health; hence, it is necessary to ensure that public polities be satisfactorily implemented to meet the needs of factors related to functional disability. Besides, given the changeable character of these variables, we recommend prevention actions be taken, mainly at primary level, to delay the emergence of disability.

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