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RESEARCH

Avaliação da capacidade funcional de idosos por meio do teste de caminhada de seis minutos

Evaluation of functional capacity of elderly through the test of six-minute walk

La evaluación de la capacidad funcional de los adultos mayores a través de la prueba de caminata de seis minutos

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ABSTRACT

Objective: To evaluate the functional capacity of older people engaged in physical activity through the test of six-minute walk test (6MWT). **Method:** An exploratory study with a quantitative approach, with 40 elderly participants of the Center for Health Care of the Elderly (CASI) of Piripiri (PI). We calculated the distance specified by demographics and the 6MWT was applied to identify the actual distance traveled. **Results:** The findings showed that the majority of participants were female, with 66 to 70 years old, married, a minimum wage income, low education. Individuals were considered hypertensive and diabetic patients traveled less value than individuals without the disease. There was no statistically significant difference between the average distance and the expected average distance. **Conclusion:** Older people who practice physical activity showed a level of functional capacity as demonstrated by satisfactory values of the distances traveled in the walk test six minutes. **Descriptors:** Elderly, Physical fitness, Functionality.

RESUMO

Objetivo: Avaliar a capacidade funcional de idosos praticantes de atividade física por meio do teste de caminhada de seis minutos (TC6). **Método:** Estudo exploratório de abordagem quantitativa, com 40 idosos atendidos no Centro de Atenção à Saúde do Idoso (CASI), de Piripiri (PI). Foi calculada a distância prevista por meio de dados antropométricos e foi aplicado o TC6 para identificar a distância real percorrida. **Resultados:** Os achados apontaram que a maioria dos participantes era do sexo feminino, com 66 a 70 anos, casados, renda de um salário mínimo, baixa escolaridade. Os indivíduos considerados hipertensos e diabéticos apresentaram valor percorrido menor do que os indivíduos sem a patologia. Não houve diferença estatisticamente significativa entre a distância média prevista e a distância média percorrida. **Conclusão:** Os idosos que praticam atividade física apresentaram um nível de capacidade funcional satisfatória conforme mostraram os valores das distâncias percorridas no teste de caminhada de seis minutos. **Descritores:** Idoso, Aptidão física, Funcionalidade.

RESUMEN

Objetivo: Evaluar la capacidad funcional de los ancianos practicantes de la actividad física a través de la prueba de caminata de seis minutos (PC6). **Método:** Un estudio exploratorio con abordaje cuantitativo, con 40 personas que participan en el Centro de Atención al Adulto Mayor (CASI) Salud de los chiles (IP). Distancia predicho por los datos antropométricos se calculó y la PM6M se aplicó para identificar la distancia real recorrida. **Resultados:** Los resultados indicaron que la mayoría de los participantes eran mujeres, con un 66 a 70 años de edad, casado, un ingreso de salario mínimo, bajo nivel de educación. Los individuos considerados hipertensos y diabéticos viajaron menos valor que las personas sin el trastorno. No hubo diferencia estadísticamente significativa entre la media prevista distancia y la distancia media recorrida. **Conclusión:** Las personas mayores que practican actividad física mostraron un grado de autonomía funcional satisfactoria como valores mostrados de las distancias recorridas en el test de caminata de seis minutos. **Descriptores:** Ancianos, Buena salud, Funcionalidad.

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INTRODUCTION

The increasing proportion of elderly has been configured a global phenomenon. In the Brazilian population is the fastest growing segment of the elderly and to Brazil this phenomenon was, until then, something that generated little concern. With the growing economic and social development of the country the increase of life expectancy is a reality that brings with it a number of concerns about the health of the elderly mainly the accumulation of chronic diseases.

Brazil has a total population of 193,946,886 million people according to the census conducted by IBGE in 2012. The amount of individuals aged 60 years or older exceeded the mark of 23.5 million Brazilians, corresponding to 12% of the population. This high value is related to the increase in life expectancy rate that is 73.1 years old today.[1]

With advancing age, the lifestyle of the elderly is changed and thus there is a change in health status. One of the points that most are suffering disruptionare the activities of personal care and skills maintenance environment or mobility. Activities such as eating, dressing, attending social events, perform leisure, may be compromised. The presence of multiple diseases may present different degrees of severity, influencing daily life. Thus, the functional capacity (FC) has been considered an indicator of the health condition and physical fitness is a component of FC.[2]

The study of functional capacity enables understanding of how longevity has been lived and allows to evaluate the health status of the elderly. It is known that the presence of multiple diseases may have different degrees of severity, affecting in daily life.[3]

The daily activities are important for predicting functional capacity components. Functional capacity or physical fitness evaluations can be simulated by physical tests, since they allow to diagnose the possible changes and to assess the effect of interventions based on exercise programs. [4]

The functionality of the individuals has a multifactorial influences such as demographic, socioeconomic, cultural, psychosocial aspects being included lifestyle such as smoking, alcoholism, physical inactivity, obesity, suffering from acute or chronic psychosocial stress, maintain social relationships and support as potential factors explanatory functional capacity.[3-4]

Functional capacity is measured by instruments called functional evaluations made by various indicators. Among them, the most cited in the literature are: mobility, basic activities of daily living (BADL), instrumental activities of daily living (IADL) and Barthel Index. One of the tests used for mobility is the Six Minutes Walk Test. This test reproduces the maximum distance walked on his own for six minutes, where the individual chooses the walking speed.[5-6]

The evaluation instruments should reliably measure exercise capacity, are low cost and easy to apply and reproduction. The walk test (6MWT) has long been used as a way to assess physical fitness in individuals somewhat conditioned physically. The 6MWT is easily applied, safe, cost effective, better tolerated, better reflect the activities of daily living, and can be executed by healthy people such as patients with cardiopulmonary diseases.[7]

The 6MWT can be related to some important functional parameters. The decrease in distance travelled suggests restriction of the ability to, for example, mild or intense housework, shopping, cooking, attending festivals or social events, climbing a flight of stairs, which are related to functional capacity and quality of life elderly.[7]

The objective of this study is to evaluate the functional capacity of elderly practitioners of physical activity through the six-minute walk test.

METHOD

Was developed a field study of exploratory and quantitative approach. The study was conducted in the city of Piripiri (PI) in the Center of Attention to the Elderly Health (CASI). Participants were selected by convenience sampling. The sample consisted of 40 subjects of both sexes. Elderly people who participate in the physical activities of the center (minimum 3 times per week) program were included.

Exclusion criteria were adopted the elderly have unstable angina, uncontrolled hypertension, recent pulmonary embolism and heart attack occurred in the month prior to testing, diastolic pressure greater than 110 mmHg and resting systolic pressure greater than 180 mmHg resting , with oximetry measure unstable, and tachycardia greater than 120 beats per minute rest, and / or clinical instability, need for walking aids; important visual, hearing or cognitive impairments that would preclude participation in the test, and refusal to perform the elderly test.[8]

Functional capacity was assessed using the six minutes walk test (6MWT). Participants were instructed on how the test should be performed being asked to walk as fast as possible and were encouraged by the examiner, by verbal stimulation, every 30 seconds. Participants were instructed to slow or even stop the test case presented very large respiratory distress, chest pain or severe muscle pain. After six minutes, the distance was recorded.[8]

Needed for the test equipment were: digital stopwatch, measuring tape, pulse oximetry, heart rate monitor, sphygmomanometer, stethoscope and balance.

From the anthropometric data collected in the evaluation of screening, the predicted distances were calculated for age, sex, height and weight of each volunteer, considered as reference values. Equation for man: expected distance (m) = (7.57 x height in cm) - (5.02 x age) - (1.76 x weight kg) - 309 m. For women: expected distance (m) = (2.11 x

height in cm) - (5.78 x age) - (2.29 x weight kg) + 667 m7. (Reference equations of Enright and Sherrill).

The data were analyzed by SPSS (version 17.0). By means of the Kolmogorov-Smirnov test was verified data normality. The statistical procedures used were the Student t test, and the Pearson's r correlation coefficient for correlating the different components of physical fitness of elderly. In all tests, it was considered a significance level of 5% ($p < 0.05$).

Participants signed an informed consent. Data were collected after approval of the study site and the Research Ethics Committee UNINOVAFAPI, subject to Resolution 196/96 of the National Health Research was authorized under number: 0391.0.043.000-11.

RESULTS E DISCUSSION

Table 01 presents the socioeconomic characteristics of the study population. 40 elderly subjects were evaluated.

Table 01. Socio-economic characteristics of the study population at CASI - Chillies-2012 (n = 40).

Variables		N	%
Sex	Male	14	35,0
	Female	26	65,0
Age	61 - 65	10	25,0
	66 - 70	17	42,5
	71 - 75	06	15,0
	76- 80	04	10,0
	81 and older	03	7,5
Civil status	Single	02	5,0
	Married	18	45,0
	Divorced	03	7,5
	Widowed	17	42,5
Income (minimum salary)	1 MS	14	35,0
	2 MS	12	30,0
	3 MS	12	30,0
	4ms or more	02	5,0
Years of study	No study	03	7,5
	1 -2 years	15	37,5
	3- 4 years	14	35,0
	5 -6	06	15,0
	7 or more	02	5,0
TOTAL		**40**	**100%**

*MS - Minimum Wage

It was found that the majority of participants were female (65%) and were aged between 66 and 70 years (30.0%). With regard to marital status, 45.0% are married, 35.0% had an income of a minimum wage and 37.5% had 1-2 years of study.

Table 02 - Characteristics of the health status of the study population at CASI - Piripiri - 2012.

Characteristics	N (%)		Expected Distance	Travelled Distance
Hypertension	Yes	28 (70,0)	450, 445 ± 51,710	455,456 ± 45,340
	No	12 (30,0)	457,456 ± 44,345	470,687 ± 58,640
Diabetis	Yes	15 (37,5)	444,934 ± 38,980	442,456 ± 41123
	No	25 (62,5)	456,345 ±60,456	463, 456±61,710
Total	**40 (100)**		**452,553 ± 54,294**	**460,925 ± 62,397**

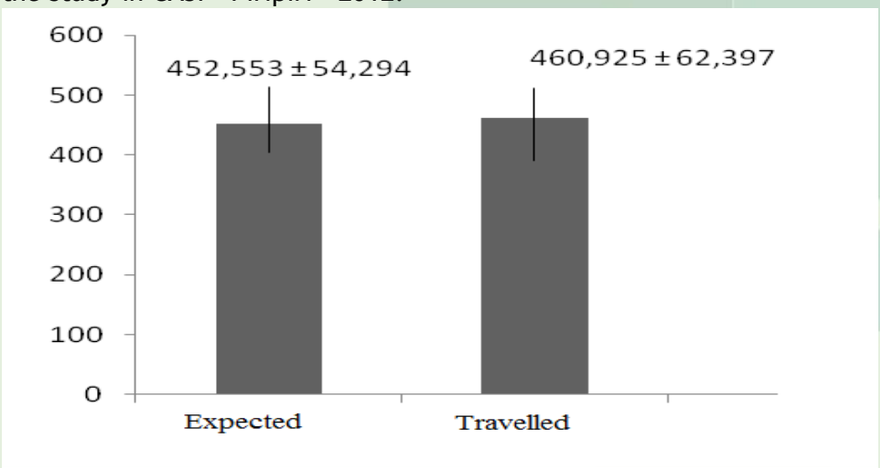
Most participants had hypertension (70%) and 62.5% diabetics. Table 2 also shows a comparison between the distance travelled and expected for hypertensive and diabetic patients, in which the subjects without pathology showed higher than individuals with diseases ($p < 0.01$) driven value.

Table 03 - Distribution of the average distance according to sex of the study population at CASI - Piripiri - 2012.

Variable	P value	Sex	Average Distance (m)
Expected distance	0,425	Male	449,050 ± 51,710
		Female	450,669 ± 55,949
Travelled distance	0,627	Male	456,571 ± 60,192
		Female	462,346 ± 64,433

The results showed no statistically significant difference between the distance travelled and the expected ($p = 0.425$ and $p = 0.627$ respectively) between men and women. ($p < 0.05$).

Graph 1. Measured and standard deviation of the distances covered in the 6MWT and planned the study in CASI - Piripiri - 2012.



There was no statistically significant difference between the average values predicted distance and middle distance (p = 0.181). Distances provided by Enright and Sherrill equation correlated to walking distances (r = 0.773, p <0.000).

The findings related to the target audience researched corroborate with other studies. It is believed that the elderly groups are usually attended by more women once they are who are more concerned with health.

In similarity to the literature data that showing higher percentage of women in older age groups reinforces the idea that women are more assiduous to health treatments. [10-11-12]

The low level of education in the studied age group is compatible with the national reality, this is a major contributing factor to negative in reducing risk factors related to functional disability impacts.[12]

The educational status influenced functional capacity, individuals with less than four years of education were associated with poor functional capacity.

The perception that the elderly have their economic status is associated with low functional capacity, this is when the individual evaluates his situation as poor or very poor functional capacity tends to be inadequate as well as income below two minimum wages.[13]

The study showed statistically significant data (p <0.01) when compared with hypertensive and diabetic subjects without pathology. The distance travelled by the hypertensive subjects was lower than the value found by the non-hypertensive and diabetic subjects had reduced distance.

Hypertension and diabetes were determining clinical situations in distance travelled in the study and thus can negatively contribute to the functional capacity of the elderly.

Similar findings have been shown in studies that evaluated the CF through the 6MWT distance in hypertensive men stage I. The distance of the hypertensive patients was compared to healthy men using the predictive equations of Enright and Sherrill. The results showed a correlation between the disease and the reduction of distance travelled (r = 0.733, p = 0.016).[14 - 15]

Another factor that may be limiting functional capacity is abdominal obesity. A review of 48 elderly for functionality using the 6MWT showed that 58.3% of study participants had waist circumference (WC) greater than 88 cm and the remaining 41.7% had

less than 88 cm CA. The group had higher CA smaller average distance travelled when compared to the group with the lowest CA ($p < 0.05$). Abdominal obesity may contribute to early functional decline and consequent failure in this population. Obesity was associated with diabetes.[16]

The research evaluated the distance travelled for six minutes in 122 subjects in different age groups (18-80 years) and correlated with body mass index (BMI) showed that subjects 60 years walked on average 457.39 ± 64 m 1 ($p < 0.05$). Subjects with body mass index <25 walked the longest distance (565.45 ± 101.56 m) compared to subjects with body mass index> 25 and <35 (492.93 ± 73.18 m) and index body mass index> 35 (457.35 ± 92.18 m). The 6MWT can be used to evaluate the performance and functional capacity of individuals with different age and body mass index.[17]

The test of six-minute walk travelled in a general way showed no statistically superior value ($p = 0.181$) than the value predicted. As shown in Figure 01. This value appears to be associated with increased functional capacity by users of CASI. In studies using the therapy as isostretching showed increased distance travelled after ten sessions. Isostretching aims to strengthen and relax the muscles, limiting both relaxing as retraction thereof, correcting posture and improving breathing capacity.[18]

The decrease in distance covered on the test correlates with difficulties in performing the activities of daily life as mild or intense housework, shopping, cooking, handling money and use the phone. [6,15,18]

The practice of regular physical activity positively affects the functional capacity mainly because there is a reduction in body fat, decrease in blood pressure, changes in glucose metabolism, increased energy expenditure, muscle mass and strength, capacity cardiorespiratory, flexibility and balance.[19]

Evaluating individuals in a health plan, classified as sedentary were almost three times more likely to disability than those who engaged in physical activity ($p < 0.01$), subjects had a greater number of diseases or were classified with depression, increased the prevalence of disability ($p < 0.001$). Respondents who reported health regular,bad or very bad had higher prevalence of functional disability ($p < 0.001$). However, individuals who reported excessive alcohol consumption had lower disability ($p < 0.01$) prevalence. Family income, economic class, gender and smoking ($p = 0.39$ $p = 0.35$ $p = 0.21$ $p = 0.98$), no statistically significant differences were found for the variables.[20]

The prediction equations for the distance of the walk in six minutes test has been studied a few years ago and most are used to ENRIGHT & Sherrill 1998 Troosters ENRIGHT et al 1999 and 2003, which cover the age range of the population evaluated in this study. However lack standardization regarding testing and little is known about what factors might influence their values (age, sex, height, weight, medical condition, emotional state, cognitive state).

CONCLUSION

Elderly people who practice physical activity showed satisfactory functional capacity, as shown by the values of the distances in the six-minute walk test. It was also possible to identify hypertension and diabetes as limiting clinical situation of functional capacity.

Not many studies that correlate the 6MWD with the level of fitness, therefore opens new horizons for research on ways to assess the functional status of the elderly, because the worse health status the largest its negative influence on the ability to perform a submaximal task and increases the risk of dependence for this population.

From the results obtained it can be seen that there is a need to improve public policies to encourage physical activity and health care of the elderly, in order to promote functional independence and enhance the quality of life.

REFERENCES

1. IBGE - Instituto Brasileiro de Geografia E Estatística. Censo Demográfico, 2012.

2. Bonardi G, Souza VBA, Moraes, JFD. Incapacidade funcional e idosos: um desafio, para os profissionais de saúde. Sci Med. 2007 jul; 17(3):138-144

3. Parahyba, MI, Veras R, Melzer D. Incapacidade funcional entre as mulheres idosas no Brasil. Rev Saúde Pública. 2005; 39(3) 383-91.

4. Rosa, TE da C. et al . Fatores determinantes da capacidade funcional entre idosos. ReV Saúde Pública. 2003; 37(1).

5. Locatelli EC, Pelizzari S, Scapini KB, Leguisamo CP, da Silva AB. Exercícios físicos na doença arterial obstrutiva periférica. J Vasc Bras. 2009;8(3):247-54.

6. Camara FM, Gerez AG, Miranda MLJ, Velardi M. Capacidade funcional do idoso: formas de avaliação e tendências. Acta Fisiatr. 2008; 15(4): 249-256.

7. Araújo CO, Makdisse MRP, Peres PAT, Tebexreni AS, Ramos LR, Matsushita AM, et al . Diferentes padronizações do teste da caminhada de seis minutos como método para mensuração da capacidade de exercício de idosos com e sem cardiopatia clinicamente evidente. Arq Bras Cardiol. 2006 mar; 86(3): 198-205.

8. ATS Statement: Guidelines for the six minute walk tests. ATS Committee on Proficiency Standards for Clinical Pulmonary Function Laboratories. Am J Respir Crit Care Med. 2002;166(1):111-7.

9. Enright PL, Sherrill DL. Reference equations for the six-minute walk in healthy adults. Am J Respir Crit Care Med. 1998;158:1384-7.

10. Cardoso ALS, Tavares A ,Plavnik FL. Aptidão física em uma população de pacientes hipertensos: avaliação das condições osteoarticulares visando a benefício cardiovascular. Rev Bras Hipertens. 2008; 15(3): 125-132.

11. Parahyba MI, Veras R. Diferenciais sociodemográficos no declínio funcional em mobilidade física entre os idosos no Brasil. Ci Saúde Coletiva, 2008; 13 (4):1257-64.

12. Torres, GV, Reis LA, Reis LA, Fernandes, MH, Alves GS. Avaliação da capacidade de realização das atividades cotidianas em idosos residentes em domicílio. Rev Baiana de Saúde Pública. 2009; 33 (3): 466-475.

13. Fiedler MM.; Peres KG. Capacidade funcional e fatores associados em idosos do Sul do Brasil: um estudo de base populacional. Cad Saúde Pública. 2008; 24 (2).

14. Costa HS. Capacidade funcional em homens hipertensos pela distância caminhada e correlação com valores preditos. Fisioter. Mov. 2009; 22 (4): 557-564.

15. Barata VF, Gastaldi AC, Mayer AF, Sologuren MJJ. Avaliação das equações de referência para predição da distância percorrida no teste de caminhada de seis minutos em idosos saudáveis brasileiros. Rev Bras Fisiot. 2005; 9(2): 165-171.

16. Campanha-Versiani L, Silveira ECBR, Pimenta MC, Alvarenga SG, Parentoni AN, Samora GAR, et al. Influência da circunferência abdominal sobre o desempenho funcional de idosas. Fisioter Pesq. 2010; 17 (4): 317-21.

17. Pires SR. Teste de caminhada de seis minutos em diferentes faixas etárias e índices de massa corporal. Rev Bras Fisioter. 2007; 11(2): 147-151.

18. Carvalho AR; Assini TCK. A. Aprimoramento da capacidade funcional de idosos submetidos a uma intervenção por isostretching. Rev Bras Fisiot. 2008; 12(4).

19. Coelho, CF; Burini, RC. Atividade física para prevenção e tratamento das doenças crônicas não transmissíveis e da incapacidade funcional. Rev Nutr. 2009; 22 (6).

20. Cardoso JH; Costa JSD. Características epidemiológicas, capacidade funcional e fatores associados em idosos de um plano de saúde. Ciênc Saúd col. 2010; 15 (6).

21. Enright PL; Sherrill DL. Reference equations for the six-minute walk in healthy adults. AM J Respir Crit Care Med. 1998; 158: 1384-1387.

22. Troosters T. et al. Six minute walking distance in healthy elderly subjects. Eur Respir J. 1999; 14: 270-274.

23. Enright PL. The 6-min walk test – a quick measure of functional status in elderly adults. Chest. 2003; 123: 387-98.

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