

Analysis of quality of life in elderly practitioners of physical activity and relationship with risk of falls.

Análise da qualidade de vida em idosos praticantes de atividade física e relação com o risco de quedas.

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Abstract

Introduction: Old age brings several factors that changes the physiological system, which results in loss of functionality in the elderly. Falls are a leading cause of death in this population or activity restrictions, social isolation, decline in health and increased risk of institutionalization. The quality of life in old age is a major challenge, it is necessary for improvement in all aspects of daily. Analyze physical exercise on quality of life of older physically active drives to see how exercise influences the improvement of the basic aspects to a healthier life, referring to physical and mental aspects of the elderly, prevention of the consequences arising from the process natural aging, such as falls. **Objective:** The aim of this study is to analyze quality of life in elderly practitioners of physical activity and relationship with risk of falls. **Method:** 84 seniors, recruited from the community of Londrina PR, physical activity practitioners, aged over 60 years who roam with or without assistive device, of both gender, composed the sample. The evaluation was through structured questionnaires that focused on socioeconomic - demographic questionnaire falls which was used the Timed Up and Go (TUGT), analysis of quality of life (SF-36) and analysis of the risk of falls. **Results:** In relationship the anthropometrics characteristics of elderly subjects analyzed, the same presentation mean age 68 years, weight 63.5 kg, height 1.52, and body mass index 27.10. Was regarding correlation between TUGT and falls in the last year ($P=0,048$) e correlation between TUGT and Physicals Components of SF-36 ($P=0,001$), and was regarding that elderly with better scores in TUGT were better scores of Physical Components of SF-36 ($P=0,003$). **Conclusion:** The quality of life is directly linked to the physical condition of the elderly, elderly practicing physical exercises have a better quality of life and less prone to falls.

Keywords: Motor Activity. Aged. Rehabilitation. Quality of life. Falls.

Resumo

Introdução: O envelhecimento traz consigo vários fatores que altera o sistema fisiológico, no qual acarreta a perda de funcionalidade no idoso. As quedas representam uma das principais causas de morte nessa população ou restrição das atividades, maior isolamento social, declínio na saúde e aumento do risco de institucionalização. A qualidade de vida na terceira idade representa um grande desafio, para isso é necessário melhorar em todos os aspectos diariamente. Analisar o exercício físico na qualidade de vida dos idosos praticantes de atividade física impulsiona a ver o quanto o exercício influencia na melhora de aspectos básicos para uma vida mais saudável, remetendo nos aspectos físicos e mentais dos idosos, para prevenção das consequências advindas do processo de envelhecimento natural, como as quedas. **Objetivo:** O objetivo deste estudo foi analisar a qualidade de vida em idosos praticantes de atividade física e a relação com o risco de quedas. **Método:** A amostra selecionada foi de 84 idosos, recrutados da comunidade de Londrina PR, praticantes de atividade física, com idade igual ou superior a 60 anos que deambulam com ou sem dispositivo de apoio, de ambos os sexos. A avaliação foi mediante questionários estruturados que enfocavam aspectos socioeconômicos-demográficos, questionário de quedas, teste Timed Up and Go, análise de qualidade de vida (SF-36) e análise do risco de quedas. **Resultados:** Em relação as características antropométricas dos idosos analisados, os mesmos apresentavam média de idade de 68 anos, peso 63,5kg, altura 1,52m e índice de massa corpórea de 27,10. Foi observada correlação entre *Timed Up and Go Test* (TUGT) e as quedas no último ano ($P=0,048$) e correlação entre TUGT e os Componentes Físicos do SF-36 ($P=0,001$), e foi observado que idosos com melhores resultados no TUGT tinham melhores escores dos Componentes Físicos do SF-36 ($P=0,003$). **Conclusão:** A qualidade de vida está diretamente ligada ao estado físico dos idosos, idosos praticantes de exercícios físicos apresentam melhor qualidade de vida e menor propensão às quedas.

Palavras-chave: Atividade Motora. Idosos. Reabilitação. Qualidade de vida. Quedas.

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INTRODUCTION

In the twentieth century more precisely in the 40s, healthy was marked by technological advances in medical care in the public system and urban policies such as vaccination, hygiene and sanitation campaigns. The Brazilian has been aging rapidly since the early 60s, when the decrease in fertility and decline in mortality began to change its age structure, progressively narrowing the base of the population pyramid in this population, as determined by the medical-sanitary action state, and structural changes, which have led to improved quality of life.⁽¹⁾

Aging brings several factors that alter the physiological system, such as: Somatosensory system, respiratory, neurological, joint and mainly in the musculoskeletal system resulting in the loss of functionality in the elderly.⁽²⁾

The performance of these systems is directly reflected in the abilities of the individual to perform daily tasks, ie, functional capacity; therefore the integration of various bodily systems under central command is fundamental to the control and maintenance of body balance.^(3,4) In relation to the aging process of the musculoskeletal system, it is associated with loss of muscle mass (sarcopenia) and corresponding reduction in maximal muscle strength. The weakness in the lower limbs is common in the elderly and has been identified as a cause of falls.^(5,6)

Postural instability presents as the main risk factor for increased falls in the elderly, this fact is crucial for the maintenance of posture and dynamic stabilization during displacement of the center of mass activities. Although predisposing factors to risk of fall are quite elucidated, ways to mitigate risk and deliver better quality of life for the elderly are been seeking.⁽⁶⁾

Falls are a leading cause of death in this population, it is high the number of seniors that fall, thus radically changing his daily life both by the fall itself, as the fear of a recurrence. Activity restrictions, social isolation, decline in health and increased risk of institutionalization are some examples of the impact on the lives of the elderly after a fall episode.⁽⁷⁾

More than half of the cases of falls associated with postural instability and originates between 65 and 75 years and approximately 30% of the patients presented symptoms at this age.⁽⁸⁾

Regular physical activity interferes directly in improving the quality of life of the elderly,⁽⁹⁾ which have several benefits to this population, including: increased bone mass, strengthening the muscles and increase joint mobility.

The loss of muscle mass has a relevance in the life of the elderly, and this loss associated with loss of muscle power leads to a decrease in the ability to promote rapid joint torque, which is needed for activities requi-

ring moderate strength, such as getting up from chair, climb stairs and maintain postural stability while avoiding obstacles. This, in addition to causing more dependency and loss of autonomy of the individual, which can facilitate the falls.⁽¹⁰⁾

Seniors who maintains an active lifestyle with physical activity may slow aging, maintaining functional capacity. A healthy lifestyle is associated to increased practice of physical activities, whether held in employment, leisure activities and domestic environment, and as a result, with better standards of health and quality of life. Thus, the quality of life in old age is a big challenge.⁽¹¹⁾

It is necessary an improvement in all aspects daily, whether social, psychological, financial and religious. An individual who has a good quality of life, through the aging process with independence and autonomy, playing social roles and staying active; this being defined as the maintenance of health at a higher level as possible in all aspects of human life. The decline of quality of life for seniors in retirement happens, getting limited in their daily activities, as this period is where the functional capacity undergoes reduction and chronic diseases arise.⁽¹¹⁾

To analyze physical exercise on quality of life of elderly individuals practicing physical activity drives to see how exercise influences the improvement of basic services for a healthier life aspects, referring to the physical and psychological aspects of the elderly, prevention of the consequences resulting from the process natural aging, such as disease, falls, and the psychological aspects such as depression and neurological diseases. Thus, the aim of this study was to assess quality of life in elderly practitioners of physical activity and relationship with risk of falls.

METHODS

Sample

The study sample was a convenience, in a cross sectional design, consisting of 84 seniors. This sample was recruited in the city of Londrina, Paraná, Brazil. Older adults aged over 60 years, active, with different levels of fitness and cognitive status equal to or greater than 19 points on the Mini Mental State Examination (MMSE) according to education were selected according to the Ministério da Saúde.

Inclusion criteria were age ≥ 60 years who roam with or without assistive device, of both gender and physically active. Were excluded elderly who presented the following conditions from the study: Neurological diseases, uncorrected visual impairment, paralysis and orthopedic disorders, inability to remain standing upright and get around without assistance.

The study was approved by the Ethics and Research Comittee of the Universidade Norte do Paraná (UNOPAR), Londrina, PR, Brazil (Number 276 702). The pro-

cedures were initiated after signing the Informed Consent, which contained information about the processes, as well as the risks and benefits associated with the research, according to Resolution 196/96 and complementary by Conselho Nacional de Saúde.

Procedures

A trained team of Laboratório de Avaliação Funcional e Performance Motora/UNOPAR performed all procedures. Volunteers read and signed the informed consent, then there was the interview, in which personal, demographic and historical data falls were provided. After the interview, we applied the MMSE; seniors who have achieved the minimum score 19 or higher were subjected to further tests. The tests were applied by the evaluation trained team by the research coordinator to assess the following variables: history of falls, risk of falls and quality of life. The administration of the test occurred randomly by means of a simple draw for each volunteer. For each test were given instructions and demonstrated the tasks to the participants.

ASSESSMENT INSTRUMENTS

Mini Mental State Examination (MMSE)

To assess cognitive function,⁽¹²⁾ was used questionnaire which consists of categories, each aiming to assess specific cognitive functions: temporal orientation (5 points), Spatial orientation (5 points), registration of three words (3 points), attention and calculation (5 points), recall of three words (3 points), language (8 points) and visual constructive ability (1 point). The total score ranges from 0 to 30 points, values lower than 19 suggest cognitive impairment.⁽¹³⁾

Short-Form health survey (SF-36)

It is a generic, validated and translated into Portuguese instrument. Composed by 36 items, divided into three aspects: functional (take care of themselves, dressing, bathing, climbing stairs); physical (impact of physical health on performance of daily and / or professional activities, pain, general health and vitality); social (emotional and mental health).⁽¹⁴⁾

Timed Up and Go Test (TUGT)

Predictor test of falls, developed in an attempt to quantify the performance of mobility through speed, the elderly, to perform a task. The test assesses balance and functional mobility in motor tasks essential for independent living, such as postural balance and self-control, so as to sit to get up, walk a short distance and change the direction of walking. (15) The test quantifies functional mobility in seconds by the time the individual to perform a task.

The test requires an individual to stand up from a

standard chair with support, but without arms, walk 3 meters, turn, walk back and sit by quantifying functional mobility in seconds by the time the individual performs the task. If the patient take up to 10 seconds to complete the task will be considered independent in their basic daily activities and low risk for falls, ten to twenty seconds perform the test, mean average risk of falls and if the task is performed in a time greater than 20 seconds will have increased risk of falls and functional dependence.

The test aims to assess mobility and balance, so easy to apply.⁽¹⁵⁻¹⁶⁾

This test has good intra reliability (ICC-0, 95) and interrater (ICC-0, 98) and determines a performance of up to 10 seconds is the normal time for testing for seniors living in the community.⁽¹⁷⁾

Statistical Analysis

To characterize the demographics data of the sample and the scores of the studied variables was used descriptive analysis, TUGT data distribution were analyzed by applying the Shapiro Wilk test, which indicated the non-normality of the sample, and as data from questionnaires, are presented as medians and ranges interquartiles.

The variables quality of life, risk of falls and fall were correlated by Spearman correlation was also checked whether there were differences for quality of life in relation to the risk of falls (groups formed by median TUGT) by Mann -Whitney. In all tests the level of significance adopted was 5% ($P < 0.05$), with a confidence interval of 95%, and the statistical package used was SPSS version 20.0.

RESULTS

The sample was composed of 84 seniors, 69 (82.1%) women and 15 (17.9%) men, with a mean age of 68 years (± 5.3), mean weight of 63.5 kg (± 1.52), mean height 1.52 m (± 0.06) and mean BMI of 27.10 (± 4.03). Regarding the number of falls, 67.9% (57) fell in the last year, and 28.6% (24) did not fall.

Data on TUGT and the scores of the SF-36 Physical and Mental Component groups component are observed in Table 1.

It was observed a correlation between TUGT and the physical component of quality of life and the falls. However no correlations between TUGT and Mental Component of Quality of Life and, between the falls and the Physical and Mental Component and Quality of Life

Table 1. TUGT e Quality of life

Variables	1° Quartile	Median	3° Quartile
TUGT	7.39	8.42	10.13
SF-36 Physical	73.75	86.87	94.18
SF-36 Mental	74.25	86.62	94.18

Subtitle: TUGT = *Time Up and Go Test*

were observed. Data correlations are shown in Table 2.

It was also analyzed whether the TUGT could be a factor that influences the quality of life. It was observed that individuals that have better TUGT results also have better Quality of Life in Physical Component with statistically significant difference (Mann-Whitney, $P = 0.03$), however this difference was not observed in the Mental Components of Quality of Life (Mann-Whitney, $P = 0.946$), the data mentioned above are shown in Table 3.

Moreover, further analysis was performed to verify that among patients who have fallen and not fallen in the last year showed differences in quality of life and outcome TUGT (Table 4). It was observed that the history of falls does not influence the result TUGT and Quality of Life (Mann-Whitney, $P > 0.05$).

DISCUSSION

It was observed corroborating with other studies that the sample was composed mainly of women, however, the composition difference between men and women apparently did not influence the variables analyzed in this study.^(18,19) In addition, the mean BMI of the sample shows they are overweight condition.⁽²⁰⁾

The inverse correlation observed between TUGT and Physical Components of Quality of Life showed that as the value obtained was lesser in TUGT (lower risk of falls) the higher the score of Components of Physical Quality of Life. A possible explanation lies in physical activity that help achieve TUGT in less time while improving obviously the Physical Component of Quality of Life,⁽²¹⁾ improving physical posture and mobility of elder-

Table 2. Correlations between TUGT, Quality of life and falls.

		TUGT	SF-36 Physical Component	SF-36 Mental Component	Falls
TUGT	P Correlation Coeficient	1.000	-.362*	-.095	.221*
		.	.001	.389	.048
Falls	P Correlation Coeficient	.221*	.018	.190	1.000
		.048	.874	.090	.

* Correlation, $P < 0.05$. Subtitle: TUGT = Time Up and Go Test

Table 3. TUGT X Quality of life SF-36

TUGT		Physical Component	Mental Component
Group 1 – Better results	N	42	42
	1º Quartile	83.18	72.56
	Median	89.25	86.75
	3º Quartile	96.75	94.31
Group 2 – Worst Results	N	42	42
	1º Quartile	66.43	78.18
	Median	82.12	86.62
	3º Quartile	90.62	94.12
	P	0.003	0.946

Subtitle: TUGT = Time Up and Go Test

Table 4. Falls X Quality of life.

Falls		Physical Component of Quality of life	Mental Component of Quality of life	TUGT
No	N	24	24	24
	1º Quartile	72.50	81.37	81.85
	Median	87.62	97.50	9.09
	3º Quartile	94.87	97.50	10.48
Yes	N	57	57	57
	1º Quartile	74.12	70.75	71.60
	Median	86.00	85.00	83.60
	3º Quartile	93.62	93.50	96.90
	P	0.705	0.072	0.106

Subtitle: TUGT = Time Up and Go Test

ly people.⁽¹⁶⁾ On the other hand, the elderly are less sedentary job mobility, greater deficits in equilibrium, and have changes in the pattern of walking.⁽²²⁾

Although no correlation between TUGT and Mental Components of quality of life have been observed, it is known that physical activity may represent a contribution towards alleviating the cognitive decline.⁽²³⁾ In addition, could avoid limitations that compromise the quality life of older people as a whole, such as mobility limitations that alter the lifestyle of the elderly, making them dependent on their activities of daily living and instrumental, together with the fear of falling back.⁽²⁴⁾

TUGT have being a predictor of falls and analyzing the consequences that it brings, such as the difficulty in returning to previous functional status to fall,⁽²⁵⁾ associated with fear of falling, make diminish the optimism of the elderly in relation to future, thus reducing quality of life.⁽²⁴⁾

Although our data do not show differences in TUGT and quality of life in elderly people who have suffered or may not fall in the previous year. The study of Fabrizio *et al*.⁽²⁶⁾ shows that the "post-fall syndrome" causes the elderly become dependent on others for self-care or to

perform activities of daily living, having thus a decline in the quality of life of the elderly. Consequently, there are important emotional, psychological and social changes such as decreased social activities, feeling of weakness and insecurity.

Several factors increase the risk of falls and may impair quality of life, especially the history itself of falls, balance disorders and muscle weakness, these related to physical ability of the elderly, and other components such as poly pharmacy (concomitant use of five or more medications), use of psychotropic medication, difficulty in walking, depression, dizziness or orthostatic hypotension, and an inability to perform basic activities of daily living, belong to the female and finally cognitive impairment.^(27,28,29)

CONCLUSION

The physical components of quality of life are related to the predictions of falls in an inverse relationship, while seniors who did not fall have higher scores on the Mental Component of Quality of Life. Thus, elderly practitioners of physical exercise have better quality of life and lower propensity to falls.

REFERENCES

1. Chaimowicz F. A saúde dos idosos brasileiros às vésperas do século XXI: problemas, projeções e alternativas. *Rev Saúde Pública*.1997;31(2): 184-200.
2. Oliveira M, Santos CLS, de Oliveira CF, Ribas DIR. Efeitos da técnica expansiva e incentivador respiratório na força da musculatura respiratória em idosos institucionalizados. *Fisioter Mov*. 2013 jan/mar;26(1): 133-40.
3. Gazzola JM, Ganança FF, Aratani MC, Perracini MR, Ganança MM. Caracterização clínica de idosos com disfunção vestibular crônica. *Rev Bras Otorrinolaringologia*, São Paulo. 2006 jul./ago;72(4): 515-522.
4. Ruwer SL, Rossi AG, Simon LF. Equilíbrio No Idoso. *Rev Bras. Otorrinolaringol*. 2005 mai./jul; 71(3): 298-303.
5. Lindle RS, Metter EJ, Lynch NA, Fleg JL, Fozard JL, Tobin J, et al. Age and gender comparisons of muscle strength in 654 woman and men aged 20-93 yr. *J Appl Physiol*. 1997;83(5): 1581-7.
6. Guimarães JMN, Farinatti PTV. Análise descritiva de variáveis teoricamente associadas ao risco de quedas em mulheres idosas. *Rev Bras Med Esporte*. 2005 Set/Out; 11(5):299-305
7. Siqueira RBG, Cader AS, Oliveira EM, Torres NVOB, Dantas EHM. Avaliação do equilíbrio estático de idosas pós-treinamento com método pilates. *R. Bras. Ci. e Mov* 2009;17(4):25-33.
8. Bittar RSM, Pedalini MEB, Bottino MA, Formigoni LG. Síndrome do desequilíbrio no idoso. *Pró-fono, Revista de Atualização Científica*. 2002;14(1): 119-28.
9. Nóbrega ACL, de Freitas EV, de Oliveira MAB, Leitão MB, Lazzoli JK, Nahas RM, et al. Posicionamento oficial da sociedade brasileira de medicina do esporte e da sociedade brasileira de geriatria e gerontologia: atividade física e saúde do idoso. *Rev Bras Med Esporte*. 1999;5(6): 207-11.
10. Pedrinelli A, Garcez-Leme LE, Nobre RSA. O efeito da à atividade física no aparelho locomotor do idoso. *Rev Bras de Ortop*; 2009;44(2):96-101
11. Toscano JJO, Oliveira ACC. Qualidade de vida em idosos com distintos níveis de atividade física. *Rev Bras Med Esporte*. 2009; 15(3):169-173.
12. Lourenço RA, Veras RP. Mini-Exame do Estado Mental: características psicométricas em idosos ambulatoriais. *Rev Saúde Pública*. 2006;40(4):712-9.
13. Almeida OP, Crocco EI. Percepção dos déficits cognitivos e alterações do comportamento em pacientes com doença de Alzheimer. *Arq Neuropsiquiatr*. 2000;58(2A):292-9.

14. Ciconelli RM, Ferraz MB, Santos W, Meinão I, Quaresma MR. Tradução para língua portuguesa e validação do questionário genérico de avaliação de qualidade de vida SF-36 (Brasil SF-36). *Rev. Bras. Reumatol*, São Paulo: Mai/Jun 1999; 39(3).
15. Podsiadlo D, Richardson S. The timed "Up & Go": a test of basic functional mobility for frail elderly persons. *J Am Geriatr Soc*. 1991;39(2):142-148.
16. Soares AV, Matos FM, Laus LH, Suzuki S. Estudo comparativo sobre a propensão de quedas em idosos institucionalizados e não institucionalizados através de mobilidade funcional. *Revista Fisioterapia Brasil*, 2003; 4(1): 12-16
17. Bischoff HA, Stähelin HB, Monsch AU, Iversen MD, Weyh A, von Dechend M, et al. Identifying a cut-off point for normal mobility: a comparison of the timed 'up and go' test in community-dwelling and institutionalized elderly women. *Age Ageing*. 2003;32(3):315-20.
18. Chaimowicz F, Dirceu GB. Dinâmica da institucionalização de idosos em Belo Horizonte. *Rev. Saúde Pública* 1999; 33 (5): 454-460.
19. Souza CC, Valmorbida LA, Oliveira JP, Borsatto AC, Lorenzini M, Knorst MR. Mobilidade funcional em idosos institucionalizados e não institucionalizados. *Rev. Bras. Geriatr. Gerontol*. 2013; 16(2):285-93.
20. WHO. Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. WHO Technical Report Series 854. Geneva: World Health Organization, 1995.
21. Guimarães L.H.C.T, Galdino D.C.A, Martins F.L.M, Vitorino D.F.M, Pereira K.L, Carvalho E.M. Comparação da propensão de quedas entre idosos que praticam atividade física e idosos sedentários. *Revista neurociências abr/jun*, 2004; 68-72.
22. Padoin PG, Gonçalves MP, Comaru T, Silva AMV. Análise comparativa entre idosos praticantes de exercício físico e sedentários quanto ao risco de quedas. *O Mundo da Saúde*, São Paulo: 2010;34(2):158-164.
23. Salkeld G, Cameron ID, Cumming RG, Easter S, Seymour J, Kurrle SE et al. Quality of life related to fear of falling and hip fracture in older women: a time trade off study. *BMJ*. 2000;320(7231):341-6.
24. Chen Y, Hwang S; Chen L, Chen D, Lan C. Risk factors for falls among elderly men in a veterans home. *J Chin Med Assoc*. 2008;71:180-5.
25. Delbaere K, Close JC, Heim J, Sachdev PS, Brodaty H, Slavin MJ, et al. A multifactorial approach to understanding fall risk in older people. *J Am Geriatr Soc* 2010;58(9):1679-85.
26. Fabrício SCC, Rodrigues RAP, Junior MLC. Causas e consequências de quedas de idosos atendidos em hospital público. *Rev Saúde Pública*, Ribeirão Preto - SP. 2004;38(1):93-9.
27. Tinetti ME, Kumar C. The patient who falls: "It's always a trade-off". *Jama* 2010;303(3):258-66.
28. Ganz DA, Bao Y, Shekelle PG, Rubenstein LZ. Will my patient fall? *Jama* 2007;297(1):77-86.
29. Moreland J, Richardson J, Chan DH, O'Neill J, Bellissimo A, Grum RM, et al. Evidence-based guidelines for the secondary prevention of falls in older adults. *Gerontology* 2003;49(2):93-116.