PHYSICAL ACTIVITY PROGRAM FOR ELDERLY AND ECONOMY FOR THE HEALTH SYSTEM

PROGRAMA DE ATIVIDADE FÍSICA PARA IDOSOS E ECONOMIA PARA O SISTEMA DE SAÚDE

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ABSTRACT

Objective: To evaluate the impact of physical activity on the use of the health system and the quality of life in sedentary elderly. Methods: A prospective interventional study was carried out between March 2010 and February 2011 with 100 subjects (60-90 years of age,) divided into active group (AG) and control group (CG). During this period, AG performed physical exercise twice a week in 60-minute sessions and the CG remained sedentary with observation of their activities. Before and after the study, all subjects were clinically evaluated and completed a quality of life questionnaire. Results: Eighty-nine subjects (AG = 44; CG = 45) were analyzed. AG had fewer visits to emergency room (p = 0.0056), hospitalizations (p = 0.0011), length of hospital stay (p = 0.0012) and fewer subsidiary tests (p = 0.0236) compared to the CG. The quality of life score analyzed before and after physical activity increased in AG compared to CG (p < 0.0001) and among subjects in AG (p < 0.0001), with no change in the CG. Conclusion: The intervention of a physical activity program for sedentary elderly can contribute to reduce the use of the health system and improve the quality of life. *Level of evidence II, Therapeutics Studies. Prospective comparative study.*

Keywords: Quality of life. Aged. Motor activity. Health systems. Sedentary lifestyle.

RESUMO

Objetivo: Avaliar o impacto da atividade física sobre o uso do sistema de saúde e a qualidade de vida em idosos sedentários. Métodos: Estudo prospectivo intervencionista (março/2010 a fevereiro/2011) com 100 indivíduos (mín. 60 e máx. 90 anos de idade), divididos em grupo ativo (GA) e grupo controle (GC). Nesse período, o GA realizou exercício físico duas vezes por semana, em sessões de 60 minutos e o GC permaneceu sedentário, com observação de suas atividades. Antes e depois do estudo, todos os indivíduos foram avaliados clinicamente e responderam a um questionário de qualidade de vida. Resultados: Foram analisados 89 indivíduos (44 no GA, e 45 no GC). O GA teve menor número de visitas ao pronto-socorro (p = 0,0056), internações (p = 0,0011), tempo de internação (p = 0,0012) e de exames subsidiários realizados (p = 0,0236) comparado com o GC. O escore de qualidade de vida, analisado pré e pós-atividade física apresentou aumento no GA em comparação com o GC (p < 0,0001) e entre os indivíduos do próprio GA (p < 0,0001), não havendo alteração no GC. Conclusão: A intervenção de um programa de atividade física para idosos sedentários pode contribuir para reduzir a utilização do sistema de saúde e melhorar a qualidade de vida. Nível de Evidência II, Estudos terapêuticos. Estudo prospectivo comparativo.

Descritores: *Qualidade de vida. Idoso. Atividade motora. Sistemas de saúde. Estilo de vida sedentário.*

INTRODUCTION

In 2013, life expectancy in Brazil was 75.2 years, growth of more than three years in a decade.[1] As the population is living longer, there is a notable increase in the prevalence of chronic diseases, many influenced by factors such as: inadequate lifestyle, environmental, inherited and genetic factors.[2] As a result of this process, there is a quantitative increase in the use of the health system, intensifying the challenge of managing this system, in ensuring quality care for the entire population,[3] which already faces a shortage of health professionals and basic infrastructure in some areas, especially in the public service, making it even more difficult to provide adequate care to the population.[4]

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Considering the main risk factors that influence the way we age (inadequate eating habits, smoking, stress and sedentary lifestyle),[5] all of which are preventable, a greater development of preventive interventional actions can improve quality of life in the aging population and, consequently, reduce their morbidity and use of the health system.[2]

Since a sedentary lifestyle was considered the fourth major risk factor for mortality among the elderly[5] in 2014, we agree with the standpoint of Haskell et al.[6] and Di Raimondo et al.,[7] that a supervised physical activity program can help prevent or delay the occurrence of new diseases, especially those among the elderly, in addition to maintaining health, at all ages.

Thus, health promotion actions can contribute to reduce the demand for hospital care and dependency, and to improve the quality of life of the population, in addition to their considerable social benefits, especially for the elderly.[6,8-11]

The aim of this study was to evaluate the impact of supervised physical activity on the quality of life of the sedentary elderly population and on the use of the health system.

MATERIALS AND METHODS

This is a prospective, interventional study in which 100 elderly patients were monitored from March 1, 2010 to February 28, 2011, conducted by the Center for Promotion and Protection of our Institution in partnership with the Municipal Department of Sports (Secretaria Municipal de Esportes - SEME) of the city of São Paulo, SP, Brazil. This study was approved by the Institutional Review Board of the Department of Public Management under No. 0122/09. All patients completed and signed the Informed Consent Form (ICF). The patients were divided into two groups: active group (AG) and control group (CG), with 50 patients in each group.

To be eligible to participate in the study the patients had to be 60 years of age or older, not have been engaged in physical activity for at least one year prior to the start of the program, and had to participate in at least 75% of the activities offered. Exclusion criteria were recent surgery or other medical contraindications to physical activity.

Individuals in both groups underwent a clinical assessment performed by the physician in charge of the study and a nurse, including a full physical examination, blood pressure and capillary blood glucose measurements, and answered the quality of life questionnaire WHOQOL-Bref (Word Health Organization Quality of Life Assessment).[12]

The AG received a twice-weekly supervised physical activity program, held on Tuesday and Thursday mornings with a duration of 60 minutes per session, on the premises of the Bicycle Park of SEME, in an outdoor space with an asphalt walking trail, with an area alongside the trail with fitness equipment installed as part of the Longevity Playground of the aforementioned park, also known as the "Senior Citizen Fitness Academy". The physical activity program consisted of aerobic physical exercises - continuous 30-minute walks along the park trail, of mild to moderate intensity, followed by resistance training – specifically designed for the main muscle groups of the various parts of the body in the form of a circuit with the different apparatuses installed in the Senior Citizen Playground, besides the use of free weights (dumbbells) weighing 1 to 2 kg and, finally, muscle stretching exercises - of moderate intensity, initially in the upright position then on the ground using mats.[6,9,13]

The CG remained under closer clinical observation over the same period, but did not engage in any physical activity.

At the end of the period, all patients were clinically reassessed by the same team, with the performance of a full physical examination, blood pressure and capillary blood glucose measurements. The WHOQOL-Bref quality of life questionnaire was also reapplied.[12]

The variables were analyzed using the relevant descriptive measures: mean, standard deviation (SD), median, minimum and maximum values for quantitative variables and absolute (n) and relative (%) frequency for categorical variables. The study groups were compared in terms of distribution of categorical variables using Pearson's Chi-square test (the Likelihood-Ratio Chi-squared test was applied if the assumptions of the classic test were not satisfied). The Student's t-test was applied in the comparison between the groups in terms of mean age and daily quality of life score. The groups were compared in terms of number of children, number of appointments attended, number of visits to the emergency department, length of hospital stay and number of drug products consumed per day using the nonparametric Mann-Whitney test. A paired t-test was used to compare the two applications of the quality of daily life questionnaire in patients in the active group. A significance level of p ≤0.05 (α = 5%) was adopted, and the SPSS (Statistical Package for the Social Sciences) program, version 15.0 for Windows (University of Chicago, USA) was used in all the tests and statistical analyses.

RESULTS

In total, 89 patients were assessed, 44 in the AG and 45 in the CG. The withdrawal of six patients from the AG included five for personal reasons, and one for health-related reasons; in the CG 5 patients were withdrawn, 2 due to health problems and 3 for personal reasons. The mean frequency of the AG was 38 patients per class (86%), with a minimum of 36 (82%) and a maximum of 40 (90%) patients.

Similarity was observed in the intergroup demographic data, predominantly in the female patients. The mean age was 76.4 years for the AG and 75 years for the CG. There was no difference in marital status, ethnicity or level of education among the study subjects.

Regarding the presence of noncommunicable (chronic) diseases (NCDs), there was no statistical difference between the groups in terms of the ratio of diseases. The presence of the disease and its characteristics were recorded in the various body systems, as described in Table 1.

Regarding how many subjects took drug products daily as well as the amount used, there was no statistically significant difference between the groups. In the AG 40 patients (90.9%) were taking drug products on a daily basis and in the CG, 43 (95.6%), with a mean of 2.6 drugs per day for both groups.

In relation to hospital admissions entered in the medical records during the study period, we observed the following significant differences: number of visits to the emergency department, subsidiary tests/examinations (except clinical analysis), hospital admissions and length of hospital stay per individual. The CG had a higher participation in all related items, when compared to the AG (Table 2).

Table 1. Presence of noncommunicable disease in the patients.

Health Data	Active Group (n=44)	Control Group (n=45)	p-value
Systemic Arterial Hypertension	30 (68.2%)	26 (57.8%)	0.3096
Diabetes Mellitus	11 (25.0%)	10 (22.2%)	0.7576
Neoplastic Diseases	6 (13.6%)	9 (20.0%)	0.4227
Endocrine Diseases	4 (9.1%)	7 (15.6%)	0.3542
Heart Diseases	9 (20.5%)	10 (22.2%)	0.8388
Neurological Diseases	4 (9.1%)	8 (17.8%)	0.2303
Musculoskeletal Diseases	15 (34.1%)	20 (44.4%)	0.3174

Two causes of hospital admission which occurred in the AG were related by digestive problems. In the CG, 14 hospital admissions were recorded: four due to gastrointestinal causes, three cardiovascular, two in respiratory clinics, two orthopedic and in the urology, neurology and vascular surgery sectors. Four of these patients underwent surgery, one of which was elective, to perform total knee arthroplasty due to osteoarthritis. Three surgeries were characterized as urgent for the treatment of lower limb thromboembolectomy due to deep vein thrombosis, osteosynthesis of wrist fracture caused by a fall, and stent placement due to coronary artery obstruction. Regarding the pre-physical activity quality of life score, the CG had a statistically higher score than the AG. Among the members of the AG, pre and post-physical activity scores showed a significant increase at the end of the program. However, exclusively in relation to the end of the program, there was a difference in scores when comparing both groups, where the AG had higher scores than the CG (Table 3).

Table 2. Use of Hospital – Health data of the patients in the study period.

Use of Hospital	Active Group (n=44)	Control Group (n=45)	p-value
Outpatient consultations	27 (61.4%)	25 (55.6%)	0.5783
Consultations held			
Mean (SD)	5.2 (6.3)	7.0 (9.2)	0.6856
Median	2.5	5.0	
Minimum – Maximum	0 – 24	0 – 42	
Visits to the Emergency Department	10 (22.7%)	23 (51.1%)	0.0056
Number of visits to the Emergency Department			
Mean (SD)	0.4 (0.8)	0.9 (1.9)	0.0125
Median	0	1	
Minimum – Maximum	0 – 3	0 – 12	
Tests performed	8 (18.2%)	18 (40.0%)	0.0236
Hospital admission	2 (4.5%)	14 (31.1%)	0.0011
Length of hospital stay (days)			
Mean (SD)	0.4 (2.4)	2.9 (5.7)	0.0012
Median	0	0	
Minimum – Maximum	0 – 16	0 – 22	
Surgery performed in the study period	0 (0%)	4 (8.9%)	0.1305

Note: 4 (9.1%) patients of the Active Group underwent cataract surgery and were not considered in the analysis of surgery performed during the study period.

Table 3. Daily Quality of Life Score of the patients according to Study group.

Daily quality of life score	Active Group (n=44)	Control Group (n=45)	p-value
Pre-assessment			< 0.0001
Median (SD)	4.1 (2.5)	6.4 (1.7)	
Median	4	6	
Minimum – Maximum	0 – 10	2 – 10	
Post-physical activity assessment			
Median (SD)	9.9 (0.5)		< 0.0001
Median	10		
Minimum – Maximum	8 – 10		
Active Group: pre-assessment vs. post-assessment			
Final assessment			< 0.0001
Median (SD)	9.9 (0.5)	6.5 (1.7)	
Median	10	6	
Minimum – Maximum	8 – 10	2 -- 10	

DISCUSSION

The aging of the population is relevant in our social context, since it gives rise to concern over the inability of the health system to absorb the demand of its specific needs, among other factors.[2,14] Scheduled physical activity, as a health promoting factor, can contribute to reduce the use of health services and improve the quality of life of the elderly population.[15]

The fact that the population of our study group was homogeneous in terms of demographics, the presence of NCDs, comparable to that of the global elderly population, the number of drug products taken daily and the number of outpatient visits allowed us to make an adequate comparison of the benefits of physical activity intervention between groups.[16]

The AG patients underwent fewer additional diagnostic tests of greater complexity than the CG. Interventional health promotion actions may have influenced this observation, as individuals with more adequately controlled health tend to use the global health system less often. Similarly, our study also noted that visits to the emergency department may be reduced in a physically active population. Elderly individuals have their own characteristics when seeking an emergency service. This may be associated with increased frailty in this age group, which in turn has a higher prevalence of chronic diseases and are at a greater risk in terms of related complications. Health promotion along with the reduction of risk factors, including falls, may also contribute to a decrease in the incidence of emergency department visits.[4,17]

Not only are hospital admissions more frequent among the elderly, but the length of hospital stays is also greater when compared to other age groups. We also noted that individuals in the CG had a greater frequency and length of hospital stay than the AG. This corroborates the theory that the adoption of preventive measures to reduce risk factors can contribute decisively to the reduction of hospital intervention, offering better health conditions to the patient, while reducing the length of hospital stays.[17,18]

The surgical procedures in our study were performed only in the CG patients and were consistent with situations arising from age-related diseases such as heart disease, peripheral vascular disease, osteoarthrosis and falls from standing height. However, results could be avoided or delayed if health promotion programs were implemented. Physical activity may have made a potential contribution to the AG not needing any surgical interventions. Improving clinical conditions and physiological responses to control NCDs, such as better balance, flexibility and muscle strength, contribute to a lower risk of falls and their consequences. Thus, this effectively reduces the risks of surgical intervention.[10,18]

Regarding quality of life, the AG had a significant improvement comparing the beginning and end of the study, and in comparison with the subjects in the CG. The CG results did not show a significant difference from start to finish. We suggest that the fact that patients in the AG had a quality of life score that was initially lower than that of the CG is probably because the previous activities of the AG were not sufficient to provide good quality of life. The CG, on the other hand, seem to be regard their daily activities as an established routine, and do not seek alternative measures to improve their quality of life.

Quality of life appears as a new paradigm of health, especially for the elderly. Healthy aging, from this perspective, arises as a result of the interaction between physical health, mental health, and social integration. Given the complexity of establishing an adequate definition of quality of life, we understand that maintaining the autonomy and independence of the older population is a determining factor. Indeed, the evidence reveals that the ability of

the aging population to implement their own desires is essential for healthy aging, far more so than simply aging without disease.[12,19] Physical exercise in primary health care is clearly important as a factor involved in deceleration of the physiological aging process. It is a healthy alternative that can contribute to active aging and maintain an independent lifestyle, consequently reducing use of the health system, such as hospitalization, length of hospital stay, more complex tests, and visits to the emergency department. In addition, it helps individuals to develop self-confidence, self-image, and socialization, significantly improving their quality of life.[9,18,20]

CONCLUSIONS

Supervised physical exercise, applied to sedentary older individuals, is an effective intervention to promote health and improve quality of life, and reduces use of health care services. In this study we observed a significant reduction in the following indicators: visits to the emergency department, hospital admissions, length of hospital stay and more complex subsidiary tests/exams. Regarding the quality of life of elderly people who have started to engage in physical activity, there was also a significant improvement when results were compared at baseline and to sedentary elderly subjects.

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