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HEALTH CONDITIONS, INCIDENCE OF FALLS AND PHYSICAL ACTIVITY LEVELS AMONG THE ELDERLY

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ABSTRACT

Objective: To relate the physical activity levels and incidence of falls among elderly people in social groups, to their health conditions. Method: This was a cross-sectional descriptive study on a sample of 256 elderly people (219 females and 37 males) of mean age 70.85 years. A form containing questions about health conditions, falls and the International Physical Activity Questionnaire (IPAQ) were used for data collection. The analysis consisted of descriptive statistics and a non-parametric test (chi-square), adopting a significance level of 5%. Results: 201 of the elderly people (79.13%) were classified as very active. Of these, only 38 had suffered falls during the last three months. Low physical activity levels presented statistically significant association with falls and current health condition (p= 0.011). Health condition related negatively with the practicing of physical activity (p= 0.016) and satisfaction with health condition (p= 0.05). Among the elderly individuals with little activity who had suffered falls, 50% reported that their current health was poor. All the elderly people with little activity who had suffered falls said that their current health condition made it difficult to practice physical activity, and only 20% of them were satisfied with their health. Conclusion: Regular practicing of physical activity seems to be associated with better health conditions among elderly people and lower incidence of falls.

Key words: the elderly; falls; physical activity; health conditions.

RESUMO

Condições de saúde, incidência de quedas e nível de atividade física dos idosos

objetivo: Relacionar o nível de atividade física e a incidência de quedas com as condições de saúde dos idosos de grupos de convivência. Método: Pesquisa descritiva transversal. Amostra de 256 idosos, 219 do sexo feminino e 37 do masculino, com média de idade de 70,85 anos. Para coleta dos dados foram utilizados um formulário com perguntas sobre as condições de saúde, quedas e o Questionário Internacional de Atividade Física (IPAQ). A análise se deu por meio de estatística descritiva e de teste não-paramétrico (qui-quadrado), adotando-se um nível de significância de 5%. Resultados: 201 idosos (79,13%) foram classificados como muito ativos. Desses, apenas 38 idosos haviam sofrido quedas nos últimos três meses. Houve relação estatisticamente significativa entre o nível de atividade física pouco ativo com o número de quedas e com a condição de saúde atual (p= 0,011). A condição de saúde se associou negativamente com a prática de atividade física (p= 0,016) e com a satisfação com a saúde (p= 0,05). Dos idosos pouco ativos que tiveram queda, 50% relataram que sua saúde atual é ruim. Todos os idosos pouco ativos que sofreram quedas disseram que sua condição de saúde atual dificulta a prática de atividade física, e apenas 20% deles estão satisfeitos com sua saúde. Conclusão: A prática regular de atividade física parece estar associada a uma melhor condição de saúde dos idosos e uma menor incidência de quedas.

Palavras-chave: idosos; quedas; atividade física; condições de saúde.

INTRODUCTION

The rise in the proportion of elderly people in the population brings to light the discussion on incapacitating incidents in that age group (over 60 years of age). These incidents are related to the decrease in functional capacity for such things as performing activities of daily life (ADLs), especially the occurrence of falls which is quite common and feared by most elderly people because of their consequences[1-3]. Aging is a dynamic and progressive process which brings morphological, functional, and biochemical changes, with diminished capacity for homeostatic adaptation to situations of functional overload, gradually altering the body and making it more susceptible to intrinsic and extrinsic harm. Among the losses experienced by the elderly is postural instability, which results from changes in the sensorial and motor systems, leading to greater risk of falling[4].

Approximately 30% of the elderly in western countries experience a fall at least once a year[5-7]. The social cost is immense and becomes even greater when the elderly person loses autonomy and independence or needs to be institutionalized[8].

Falls among the elderly are a growing cause of injury, treatment costs and death. The consequences of the injuries suffered at an advanced age are more serious than among younger people. For injuries of the same severity, the elderly experience more incapacity, longer admittance periods, long rehabilitation periods, and a greater risk of subsequent dependence or death[9]. Efficient interventions are based on early detection of elderly people at a higher risk of falling, whether or not due to illness, adaptation to their surroundings or regular physical activity.

Traditionally, motor deterioration due to aging, disorders and illness is said to cause difficulty or inability to maintain balance. Medical models suggest that infirmities progressively lead to deficit and limitation in function, and ultimately to the inability to maintain balance[10,11]. The scientific community has studied the benefits brought about by physical exercise among the elderly[12,13], with emphasis on those that improve functional capacity, balance, strength, coordination and speed of movement, therefore contributing to greater safety and prevention of falls.

Despite the evident increase in falls among the elderly, Brazilian gerontological and geriatric literature contains few epidemiological studies on this subject[8]. The present study is justified by the need for research on the relationship between regular physical activity, incidence of falls and health conditions in order to develop more effective interventions to prevent these accidents and improve the quality of life of elderly people. Thus, the objective of this study is to investigate the relationship between the health conditions and the level of physical activity and incidence of falls of the elderly.

METHODS

Characterization of research

The study was transversal, descriptive and epidemiologic in nature.

Subjects

The population from which the study sample was withdrew was comprised of 1,280 elderly people (aged 60 and over) assisted by 37 Elderly Social Groups registered at the Office for Development and Social Service of the City of São José and the Social Service Volunteer Association of São José (AVJAS). The sample was probabilistic in nature, with the technique of proportional random selection (20%) of the elderly who participated in the 37 Elderly Social Groups registered at the Office for Development and Social Service of the City Council and the Social Service Volunteer Association of São José, in the city of São José, SC, Brazil. The sample was comprised of 256 elderly people, 219 female and 37 male, with a mean of 70.85 years of age (SD=6.7).

Materials and procedures

The following materials were used for data collection:

A form containing identification data and questions about health conditions and falls, which was validated and used in a thesis on physical activity and quality of life among elderly women[14].

The International Physical Activity Questionaire (IPAQ), long form, usual week, adapted by Benedetti, Mazo and Barros[15], that aims to measure physical activities performed in the domains of work, transport, domestic activities, and leisure[16].

The study was approved by the Research and Extension Assessment Committee of Universidade do Estado de Santa Catarina (UDESC) on 19 April of 2004, Approval number 44/2004. Data were collected by the researcher and previously trained interviewers. The interview generally took place within the group's facilities or in an adjoining room. Before the interview, the elderly people were instructed on the study's objective, importance, confidentiality of identity, method of application, and destination of data obtained. The elderly people signed written informed consent and were then interviewed.

Treatment of data

To interpret the level of physical activity of the elderly through the IPAQ, we used the criterion based on recommendations of physical activity thresholds that result in health benefits[16], classifying as "active" the individuals who practiced a minimum of 300 minutes of at least moderate physical activity per week (min/week). Based on that criterion, the sample of this study was divided into two activity levels: low (< 300 min/week) and high (≥ 300 min/week).

The data were stored and treated in the SPSS 13.0 statistics software. Data were analyzed using descriptive statistics and chi-square non-parametric test with a significance level of 5%.

RESULTS

The sample had greater prevalence of female individuals (85.5%), with a mean age of 70.85, level of education ranging from 1 to 3 years of study (38.3%) and 4 to 11 years (39.8%) of study; 82% of the elderly people lived with a spouse, family members and/or others. Table 1 illustrates the frequency of these sociodemographic characteristics.

In Table 1, the answers of 256 elderly people were considered, however there was sample loss of two individuals who, for irrelevant reasons, did not take the IPAQ test, and were not considered in the analyses that involved the level of physical activity, thus totaling 254 elderly individuals in tables 2 and 3. Regarding the level of physical activity, 201 elderly people (79.13% of the sample) were very active and only 38 of them suffered falls in the three months prior to data collection. Table 2 shows the incidence of falls relative to the level of physical activity.

Table 1. Sociodemographic characteristics of the sample.

Variables	n	%
Gender		
Female	219	85.5
Male	37	14.5
Age groups		
60 to 64	47	18.4
65 to 69	78	30.5
70 to 74	51	19.9
75 to 79	51	19.9
Over 80	29	11.3
Level of education		
No education	37	14.5
1 to 3 years	98	38.3
4 to 11 years	102	39.8
12 to 14 years	12	4.7
More than 15 years	7	2.7
Living status		
Alone	46	18.0
With others	210	82.0
Total (n and %)	**256**	**100%**

Table 2. Frequency of falls and level of physical activity.

Level of physical activity	Falls			
	Yes		No	
	n	%	N	%
Low	10	20.8	43	20.8
High	38	79.2	163	79.2
Total (n %)	48	100%	206	100%

The analysis between the level of physical activity (PA) and incidence of falls and the health conditions of the elderly people revealed a significance level among a few variables ("low" PA level, "falls", "poor health condition", "health hinders PA" and "dissatisfaction with health"). Table 3 presents the frequency of the studied variables. There was a statistically significant difference between low PA levels and falls, with current health conditions (p= 0.011), and 50% of low PA level subjects who had falls reported that their current health condition is poor. There was also a statistically significant difference between a low PA level and falls, with health conditions hindering physical activity (p = 0.016). All low PA level subjects who suffered falls reported that their present health condition hinders physical activity.

There was no statistically significant difference (p = 0.124) between the low PA level subjects who had falls and the perception of health in the last 5 years, however 80% reported that their health is deteriorating when compared to the last 5 years. There was statistically significant difference among low PA levels, falls, and dissatisfaction with health (p= 0.05). Only 20% of low PA level subjects who had falls are satisfied with their health.

DISCUSSION

Falls and their consequences are present in all phases of life, however, they are seen more explicitly as posing a problem in older age. They are frequent in this age group, and the elderly individuals have a greater risk of injury when they fall. The psychological impact of falling is another important factor among older individuals[17,18]. In a study about the incidence of falls, Lehtolas et al.[19] found that the highest incidence of falls was among older elderly men who lived at home.

Table 3. Chi-squared values (X^2) between the level of physical activity, incidence of falls and health conditions of the sample.

Health Conditions	Level of physical activity							
	Low				High			
	Falls				Falls			
	Yes		No		Yes		No	
	n	%	n	%	n	%	n	%
Illness								
Yes	10	100.0	42	97.7	36	94.7	150	92.1
No	0	0.0	1	2.3	2	5.3	13	7.9
X^2 (value and p)	v= 0.24		p= 0.626		v= 0.31		p= 0.578	
Current Health								
Bad	5	50.0 [a]	5	11.6	7	18.4	28	17.2
Medium	4	40.0	18	41.9	10	26.3	58	35.6
Good	1	10.0	20	46.5 [a]	21	55.3	77	47.2
X^2 (value and p)	v= 9.07		p= 0.011 *		v= 1.25		p= 0.535	
Health condition hinders PA								
Yes	10	100.0 [a]	26	60.5	13	34.2	67	41.1
No	0	0.0	17	39.5 [a]	25	65.8	96	58.9
X^2 (value and p)	v= 5.82		p= 0.016 *		v= 0.53		p= 0.467	
Health condition in the last 5 years								
Better	1	10.0	11	25.6	16	42.1	53	32.5
Same	1	10.0	13	30.2	7	18.4	55	33.7
Worse	8	80.0 [a]	19	44.2	15	39.5	52	31.9
X^2 (value and p)	v= 4.17		p= 0.124		v= 4.73		p= 0.192	
Satisfaction with health condition								
Dissatisfied	4	40.0	8	18.6	5	13.2	24	14.7
Partially Satisfied	4	40.0	8	18.6	3	8.1	34	20.9
Satisfied	2	20.0 [a]	27	62.8 [a]	30	78.9	105	64.4
X^2 (value and p)	v= 5.99		p= 0.050 *		v= 3.69		p= 0.158	
Total (n %)	10	100.0	43	100.0	38	100.0	163	100.0

[a] adjusted residue >[2]; * p<0.05

In this study, when the PA level and the incidence of falls were compared to the health conditions of the elderly, there was a level of significance among some of the variables ("low" PA level, "falls", "poor health conditions", "health hinders PA", and "dissatisfaction with health"); this might corroborate the importance of maintaining a high level of physical activity in order to minimize the incidence of falls and improve general health. The American College of Sports Medicine[20] states that, at present, it has been proven that the more active a person is, the fewer physical limitations they will have.

Because muscle weakness, lack of flexibility, degraded synergy and programming mechanisms and motor control difficulties contribute to falls, a high level of physical activity is an efficient prevention strategy: it increases muscle strength, flexibility and motor control[13]. Cornillon et al.[21] found that 10 sessions of physical activity improved the elderly subjects' performance in various balance, strength, and flexibility tests, which suggests that a prevention program based on regular exercise can help to prevent falls among the elderly. In this study, of the 186 high PA level elderly subjects with illness, only 36 had falls in the three months prior to data collection, showing that despite illness, falling incidents can be reduced if the elderly person remains very active.

The association between health and wellbeing is reciprocal. Not only does health condition influence the perception of wellbeing, but people's feelings and wellbeing also influence other health-related behaviors. Those who have a sense of wellbeing and personal satisfaction have a higher probability of taking measures to maintain their health and prevent illness[13,22].

Oliveira[23] states that there are five conditions to being a healthy elderly person: independence, housing, occupation, affection, and communication. Regular physical activity minimizes the decline in functional capacity, which is necessary for the elderly person to have an independent life and, consequently, better health conditions. Physical activity on a regular basis is a way of preventing falls among elderly people. Sedentary elderly people have less mobility and higher propensity to falls compared to elderly people who exercise regularly. However, further studies

involving more homogenous groups must be conducted to confirm these findings[4].

According to Spirduso[13], daily physical activity and exercise may contribute to fall prevention because the overall findings of studies on this subject suggest that an exercise program that significantly improves strength and balance and that also maintains body shape and weight should reduce the number of falls observed among older people. According to Guimarães et al.[4], physical activity is a mode of therapy that improves physical mobility and postural stability, which are directly associated with reducing falls.

Changes in balance among the elderly population are relatively common problems and lead to serious limitations in activities of daily life and are a primary cause of falls among these individuals[24]. Many studies, like those of Faber et al.[25], Cornillon et al[21]., and Spirduso[13] have examined the effects of physical exercise on postural stability, but few investigators have continued to examine the subsequent effects on the frequency of falls in daily life. Participation in a low-intensity exercise program has proved to significantly reduce the number of falls among the elderly when compared to the control groups who did not exercise.

CONCLUSIONS

This study allowed us to conclude that physical activity has a beneficial influence on the health condition of the elderly population and may contribute to a lower incidence of falls in this population. Although countless studies have already shown that physical activity reduces the effects of aging, sedentary lifestyles have become very common, contributing to the acceleration of functional losses among the elderly. This study found greater mobility and lower propensity for falls in elderly people with a higher level of physical activity.

A specific and efficient exercise program for the elderly must aim to improve the individual's physical capacity and reduce the deterioration of physical aptitude, such as cardiovascular resistance, strength, flexibility, and balance. Besides the implementation of physical activity programs geared toward the elderly, the following are also necessary: development of public policies that promote the reduction of falls, such as improving and adapting the infrastructure of public and private facilities; greater government incentive to physical exercise; more nutritional and medical prevention, among other things.

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