



FACTORS ASSOCIATED WITH BEING INSUFFICIENTLY PHYSICALLY ACTIVE AMONG THE OLDEST OLD PARTICIPATING IN COMMUNITY GROUPS

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Abstract: *Introduction:* The oldest old are the group with lowest physical activity levels, and many factors can contribute to this. *Objective:* To analyze which socio-demographic and health related factors are associated with being insufficiently physically active among adults aged 80 years and older participating in community groups. *Methods:* This research was characterized as cross-sectional descriptive epidemiological research. The study was carried out with 351 "oldest old" participants of 102 community groups for elderly registered in the City Hall of Florianópolis in the state of Santa Catarina. The instruments used were a Fact Sheet to assess socio-demographic and health related characteristics and the International Physical Activity Questionnaire (IPAQ). Descriptive statistics and Multivariate Hierarchical Poisson regression analysis were used adopting a 95% confidence interval. *Results:* The prevalence of very active oldest old participating in community groups was 45.86%. After adjusted analysis the factors associated with being insufficiently physically active among the oldest old participating in community groups were: higher age strata, lower education level, lower income and worse perceived health status. *Conclusion:* Physically inactive elderly who show such characteristics should be encouraged to do adequate physical exercise to prevent and reduce the risk of disabilities and diseases caused by the aging process.

Key words: Oldest old, socially active, physical activity, health status.

Introduction

The world is experiencing an unprecedented demographic transformation as life expectancy and population aging increase (1). The fastest growing group is of those aged 80 years and older, who are often called the "oldest old" (2).

The prevalence of morbidity and disability is higher for this elderly group (3), especially chronic diseases (4). The most common diseases among this age group were: hypertension (2, 5), cerebral stroke, cancer, heart diseases (4, 5), hypercholesterolemia and arthritis (2).

Chronic diseases, besides being associated with aging, have shown association with sedentary behavior (6,7). Physical inactivity is a risk factor that causes several metabolic abnormalities, which contribute for the development of chronic diseases (6). However, it has been reported that the elderly represent the age group

with the lowest level of physical activity, especially for the oldest ones (8).

Additionally, some studies have shown that socially active elderly - who develop good levels of social connection, which included social communication and activities with neighbors and relatives - have better health and are more likely to live longer (9, 10). In Brazil, there are community groups for the elderly that encourage their social participation. The association between being more physically active and participating in community groups has been previously described for older adults younger than 70 years old and women (11). However, it is still necessary to investigate other factors that provide a higher level of physical activity among those elderly, who have more active social life.

It is understood that, in addition to health status, other characteristics can affect the level of physical activity in the elderly such as sex (12, 13), age, education level, ethnics and income (14). Studies with elderly (14, 15, 16) indicate that sociodemographic characteristics may affect the level of physical activity in this population.

Therefore, the objective of this study was to analyze which socio-demographic and health related factors are associated with being insufficiently physically active among adults aged 80 years and older participating in

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community groups for the elderly in Florianópolis/SC. The hypothesis of the present study is that chronic diseases, as well as sex and age are limiting factors to the practice of physical activities for the oldest old who are socially active.

Method

Type of study and ethical procedures

The present cross-sectional descriptive epidemiological research was approved by the Ethics Committee of the Santa Catarina State University (resolution 149/2010), as specified in the law 196/96 for Humans Research. Data were collected from September 2010 to April 2011.

Population and Sample

In Brazil there are about 3 million "oldest old people" (aged 80 years and older), and this population is projected to increase to nine million in 2020 and 14 million by 2040. In Santa Catarina, it is estimated that there are near 80 thousand seniors in this age group, and more than 7 thousand of them live in Florianópolis/SC, the city chosen for this study (2).

A record of 497 oldest old enrolled in at least one of the 102 community groups for the elderly registered in the City hall of Florianópolis/SC was found. Apart from the elderly who were absent in the days of data collection (n=135) or refused to participate in the study (n=7), the sample comprised 351 "oldest old". Sample size calculation was not performed since the purpose was to evaluate all population.

Community groups for the elderly are based on educational practices developed in groups that have common goals or purposes. These groups provide participatory education, in order all of them participate actively in group work. The community groups registered in the City Hall of Florianópolis-SC offer different activities, such as: manual activities (knitting, crocheting and sewing), recreational activities (bingo, cards and dominoes), educational activities (lectures and courses), tours and refreshments. The groups typically meet once a week.

Instruments

- Fact sheet used in the Study Group of the Third Age (GETI) from the University of Santa Catarina with self-reported questions on socio-demographic characteristics: Sex (two categories: male or female), marital status (two categories: single/widow/divorced and married), age (three categories: 80-85, 86-90 or >90 years old), education level (three categories: illiterate, incomplete elementary school or complete elementary school or higher), ethnics

(two categories: Caucasian and Afro-descendent), and income (three categories: less than 1, 1 or 2, 3 or more minimum wages).

Health status was measured with the question: "How do you consider your health?" Answer options were very good, good, fair, poor or very bad. These answers were grouped in two categories: good (very good and good) and poor (fair, poor or very bad). Also the elderly were asked about the presence or absence of some diseases (systolic arterial hypertension, heart diseases, diabetes, osteoarthritis, osteoporosis and dyslipidemia) and these data were compared with information about the continuous use of medicines.

- International Physical Activity Questionnaire (IPAQ) long form adapted for the elderly (17), applied during an interview with well-trained researchers. This instrument estimates the weekly energy expenditure of physical activities related to work, leisure, transport and housework and in the sitting position. Activities carried out during a normal week for at least 10 continuous minutes of moderate - vigorous intensity were considered.

For a better understanding of the results, the dependent variable level of physical activity was dichotomized as: insufficiently active and very active. The PA level cut-off point was of 150 min/week of at least moderate PA, corresponding to activities that take moderate physical effort and make you breathe somewhat harder than normal (18).

Procedures

Firstly, the City Hall of Florianópolis/SC was contacted to collect data about the community groups accounted in the city and also the name and number of coordinators for each group. Then, these coordinators were contacted and asked for permission to do the research. The next step was to identify how many "oldest old" were enrolled in each of the groups, invite them to participate in the study, clarifying its objective. The "oldest old" who agreed to participate in the study signed a consent form in two copies, one kept by the researcher and the other by the participant.

The instruments were used in individual interviews during one of the meetings of the community group.

Analysis of Data

The data were analyzed using the SPSS 17.0 program. Descriptive statistics were calculated (absolute and relative frequency, confidence interval, mean, and standard deviation).

Multivariate Poisson Regression analysis with robust estimation was used to obtain crude and adjusted prevalence ratios regarding associations between being less physically active and socio-demographic and health





related factors. A hierarchical model was considered for adjustments wherever variables that showed $p < 0.25$ at crude analysis were included for adjustments (19). Variables of level 1 (socio-demographic) were adjusted between them and those that presented $p < .025$ were maintained for adjustment in the next level (level 2 - health related factors). A 95% confidence interval was adopted.

Results

Most of the oldest old participating in the community groups were women (92%), aged between 80 and 85 years (69.8%), widows (77.2%), with incomplete elementary school education (55.8%), Caucasians (93.7%), and

monthly family income ranging between 1 and 3 minimum wages (46.4%). In general, they rated their health as fair (39.6%) or good (40.7%).

The prevalence of very active oldest old was 45.86% (CI 95%: 40.6- 51.2). The most common diseases found among seniors aged 80 years and older in the community groups were: hypertension, heart diseases, diabetes, dyslipidemia, and osteoporosis.

Table 1 presents socio-demographic and health related factors associated with being insufficiently physically active among the oldest old that participate in community groups. Considering socio-demographic factors in crude estimates, the following variables showed to be associated with being insufficiently physically active among the oldest old: female sex,

Table 1

Socio-demographic and health related factors associated with being insufficiently physically active among oldest old.

	Variables	Very Active (n=161) n (%)	Insufficiently Active (n=190) n (%)	Crude Analysis	Adjusted Analysis
				PR (CI)	PR (CI)
Level 1 - Socio-demographic	Sex				
	Women	141 (43.7)	182 (56.3)	1.97 (1.09-3.57)*	1.83 (0.98-3.42)
	Men	20 (71.4)	8 (28.6)	1	1
	Marital status				
	Single/widow/divorced	130 (43)	172 (57)	1.55 (1.06-2.27)*	1.23(0.81-1.89)
	Married	31 (63.3)	18 (36.7)	1	##1
	Age strata				
	80 – 85 years old	128 (52.2)	117(47.8)	1	1
	86 – 90 years old	26 (32.5)	54 (67.5)	1.41 (1.15-1.73)*	1.35 (1.11-1.63)*
	> 90 years old	6 (25)	18 (75)	1.57 (1.20-2.04)*	1.55 (1.19-2.01)*
	Education				
	Illiterate	18 (40)	27 (60)	1.37 (0.99-1.89)	1.22 (0.88-1.68)
	Incomplete elementary school	81 (41.3)	115 (58.7)	1.34 (1.05-1.71)*	1.35 (1.06-1.71)*
	Complete elementary school	62 (56.4)	48 (43.6)	1	1
Ethnics					
Caucasian	148 (45)	181 (55)	1.22 (0.74-2.00)	#	
Afro-descendent	11 (55)	9 (45)	1		
Income (minimum wages)					
< than 1	7 (17.5)	33 (82.5)	1.60 (1.31-1.95)*	1.44 (1.19-1.76)*	
1 or 2	54 (51.4)	51 (48.6)	0.94 (0.75-1.19)	0.86 (0.68-1.08)	
3 or more	100 (48.5)	106 (51.5)	1	1	
Level 2 - Health related	Health Status				
	Good (Very good/good)	94 (55)	77 (45)	1	1
	Poor (Fair/poor/very poor)	67 (37.2)	113 (62.8)	1.39 (1.14 -1.70)*	1.25 (1.03 -1.52)*
	Hypertension				
	Yes	86 (40.8)	125 (59.2)	1.27 (1.03-1.57)*	1.22 (0.98-1.51)
	No	75 (53.6)	65 (46.4)	1	1
	Heart Diseases				
	Yes	39 (41.9)	54 (58.1)	1.10 (0.89-1.35)	#
	No		122 (47.3)	136 (52.7)	1
	Diabetes				
	Yes	25 (32.5)	52 (67.5)	1.34 (1.10-1.63)*	1.15 (0.94-1.41)
	No	136 (49.6)	138 (50.4)	1	1
	Osteoporosis				
	Yes	23 (35.4)	42 (64.6)	1.25 (1.01-1.54)*	1.19 (0.97-1.46)
No	138 (48.3)	148 (51.7)	1	1	
Dyslipidemia					
Yes	32 (42.1)	44 (57.9)	1.09 (0.87-1.36)	#	
No	129 (46.9)	146 (53.1)	1		

PR=Prevalence Rate; CI= Confidence interval; *Significant for $p < .05$; # variables not inserted in multivariate Poisson Regression Model for not presenting $p < .25$ in crude analysis; ## Variable excluded of level 2 analysis for not presenting $p < .25$ after adjustments in level 1.





marital status (those that did not live with a partner), higher age strata (having more than 86 years), lower education (having incomplete elementary school) and lower income (receiving less than 1 minimum wage) - table 1. On the other hand, the following health related factors were associated with being insufficiently physically active in the non-adjusted analysis: poor perceived health status, presenting hypertension, diabetes and osteoporosis.

After intra and inter levels adjustments, according to the hierarchical model, the following socio-demographic factors remained associated: age strata, education, and income. The prevalence of insufficiently active oldest old was higher among those aged between 86 and over if compared to the prevalence of those aged between 80 and 85 years old (table 1). Also the prevalence of insufficiently active oldest old was 1.35 higher among those that presented incomplete elementary school when compared to those with complete elementary school or higher education level. The prevalence of insufficiently physically active oldest old was 1.44 higher among those that received less than one minimum wage compared to the prevalence of those that received three or more minimum wages.

After adjustments, only self-reported health status remained associated among health related factors. The prevalence of insufficiently active oldest old was 1.25 higher among those that evaluated their health as "poor" compared to those that considered it as "good".

Discussion

The prevalence of very active oldest old participating in community groups was high (45.86%). This is an unexpected result showing that many of the oldest old that participate in community groups follow the recommended level of physical activity for adults. The city where data were collected is surrounded by many beaches and public places favorable for physical exercise practice. Furthermore, in Florianopolis, Brazil, there are two groups of studies and research focused on the practice of physical activities for the elderly and also a program of the municipal government called "Floripa Ativa", which may influence the adoption of physical activity as a regular practice by oldest old.

After a hierarchical adjusted regression analysis we found that socio-demographic (age strata, education level, and income) and health related (perceived health status) factors were associated with being insufficiently physically active among the oldest old that participate in community groups. Physically inactive elderly who show such characteristics should be encouraged to do adequate physical exercise to prevent and reduce the risk of disabilities and diseases caused by the aging process.

Despite the higher proportion of women participating in social groups, it was found, before adjustments, that

women presented 1.97 higher prevalence of being insufficiently active compared to men. But this association lost significance when adjusted for other socio-demographic variables – age, education, income and marital status. It can be seen that men tend to be more physically active than women (12, 13, 20).

As observed by other Brazilian studies (21, 22), a higher proportion of women aged 80 years and older participating in social groups was also found in this study. This could be justifiable by the fact that women understand the need of socializing with others more readily than men. On the other hand, it may also be a consequence that unhealthy men have died before the age of 80 leaving only the healthiest for the study, since it is comprehensible that women live much longer than men (23). One limitation of this study is not having information about the oldest old that do not participate in community groups.

Another result found in this study was that elderly people are more likely to be insufficiently physically active in advancing age. It was already demonstrated in previous studies (14, 24) and was justified by the bio psychosocial losses that the aging process causes to the oldest old, contributing to their physical inactivity (15, 23).

Also, the prevalence of insufficiently active oldest old was 1.35 higher among those that presented incomplete elementary school when compared to those with complete elementary school or higher education level. Surprisingly illiterate individuals did not present higher chance to be less physically active than those with higher education levels.

Another socio-demographic factor associated to lower level of physical activity was the income. The prevalence of insufficiently physically active oldest old was 1.44 higher among those that received less than one minimum wage compared to those that received three or more minimum wages. A Research conducted with people over 60 years of age (15, 25) shows that low socioeconomic status is a risk factor for physical inactivity, since people who have lower socioeconomic status tend to be physically inactive.

Most seniors reported having good health, which show that satisfaction with health is usually high at this age. This perception may be related primarily to the fact that it was measured by self-report, and elderly perceive their health more positively compared with other informant reports (26). Another fact that explains this good perception of their health is their participation in community groups, because it was reported that seniors who participate in these groups have a healthier lifestyle, increased self-esteem, better social and family relationships and improved quality of life (9, 10).

In this study, the seniors participating in the community groups who self-evaluated their health as "fair, poor or very poor" presented 1.25 higher





prevalence of being insufficiently physically active than those that perceived their health as “good or very good”. This was also observed in a recent study with elderly Germans aged between 72 and 93 years (12) and in a literature review of studies with elderly aged older than 65 years (14). It was understood that maintaining some physical activity in the oldest old helps to prevent and minimize disability caused by diseases that come with the aging process (1, 27). Thus, it is necessary to encourage physical activity, because today it is a consensus among health professionals that physical activity is a decisive factor for having good health and healthy aging (1). Unfortunately the design of this cross sectional study does not allow inferences about causal relationships. So, it is still not clear if poor self-reported health could be a limiting factor for physical activity or the opposite.

Elderly people who participate in community groups tend to be more physically active, so these groups may represent an effective strategy for promoting an active lifestyle (11, 28). In this context, our Brazilian local experience within the community group setting might encourage other countries that still do not have such public health policies to implement them in order to improve the quality of life of the oldest old. We suggest the development of population-based studies that evaluates socio-demographic, physical activity and health related factors, which include individuals limited to bed or their home environment.

An important limitation of this study is the fact that the diseases and the physical activity level of the oldest old were assessed by their self-report. Additionally, aspects such as depression, obesity, well being, satisfaction with life and other environmental characteristics were not considered in this study. Another question for future researches arises as to whether the factors that promote individuals to be in social activities might be the same as those promoting physical activity.

Conflict of Interest: None.

Description of Author's Roles: R. Krug designed the study, collected the data and wrote the paper. C. Sacomori was responsible for the statistical design and for carrying out the statistical analysis and writing the paper. M. A. Lopes designed the study, collected the data and assisted with writing the article. M. Marchesan collected the data and assisted with writing the article. G.Z. Mazo designed the study, supervised data collection and assisted with writing the article.

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