CLINICAL SCIENCE

Association between participation in community groups and being more physically active among older adults from Florianópolis, Brazil

Giovana Zarpellon Mazo, Tânia Bertoldo Benedetti, Cinara Sacomori

Universidade do Estado de Santa Catarina (UDESC), Centro de Ciências da Saúde e do Esporte (CEFID), Florianópolis/SC, Brazil.

OBJECTIVE: In Brazil, older adults frequently participate in community groups. However, the influence of this participation on physical activity levels has not been fully investigated. It is known that both regular physical activity and social support are beneficial for health. The aim of this study is to evaluate the association between participation in community groups and physical activity among older adults from Florianópolis, Brazil.

METHODS: The sample consisted of 1062 adults with a mean age of 71.9 ($\pm$7.6) years. Among these individuals, 293 subjects participated in community groups and 769 did not. A questionnaire to collect sociodemographic data and the long version of the International Physical Activity Questionnaire were used for the assessment.

RESULTS: The prevalence of active older adults was 66.6% among participants in community groups and 58.4% among non-participants. Participation in these groups was significantly associated with being more physically active in the transportation and domestic domains, but with being less physically active in the leisure-time domain. Some changes in these associations were observed when the sample was stratified by age, gender, body mass index, and health status. With respect to total physical activity, participation in community groups was associated with being more physically active in only two strata (subjects younger than 70 years and women).

CONCLUSION: The results of this study indicate that older adults who participate in community groups are characterized by a greater probability of being more physically active. However, longitudinal studies are needed to determine whether participation in community groups facilitates the adoption of physically active behavior.

KEYWORDS: Physical Activity; Community Groups; Older Adults; Health; Social Support.

INTRODUCTION

Physical inactivity among older adults is considered a public health problem because of its high prevalence, with most older adults not achieving recommended physical activity (PA) levels.[1-3] Physical inactivity is known to reduce healthy life expectancy.[2,3] Therefore, regular engagement of older adults in PA groups may delay age-related decline, prevent the deleterious effects of different chronic diseases, and promote social ties.[3-5] In this respect, adequate PA levels are generally associated with younger age, health,[6-9] male gender, reduced psychological distress, rural residency,[6] higher income, educational level, and socioeconomic status,[8,10] and a lower body mass index (BMI).[8,9,11] Furthermore, continuous engagement in PA programs has been associated with male gender, nonsmoking, and fast walking speeds.[12]

In addition to regular PA, social support has also been reported to be beneficial for the health of older adults.[2,13,14] One systematic review suggested that participation in social groups generally prevents and alleviates social isolation and loneliness and improves overall well-being.[15] In Brazil, there are social programs that contribute to the autonomy and socialization of older adults, such as community centers for the elderly.[16]

However, population-based studies provide little information about the PA patterns of older adults who participate in community groups. It has been recognized that this participation can foster friendships[14] and favor the adoption of a more active lifestyle because leisure, cultural, intellectual, physical, manual, and artistic activities as well as group interactions take place in these groups.[17] Older adults who participate in such groups have been suggested to have higher self-esteem, which

No potential conflict of interest was reported.

improves family integration and contributes to the recovery of personal and social values.[18]

The objective of this study was to compare PA levels between participants in community groups and non-participants and evaluate the association between participation in these groups and being more physically active among older adults from Florianópolis, Brazil. We hypothesized that being socially active through participating in community groups would be associated with being physically active. It was also expected that gender, age, health status, educational level, and BMI would influence this association.

MATERIALS AND METHODS

Population and sample

A cross-sectional, population-based study was conducted involving the elderly population (age ≥60 years) of the municipality of Florianópolis, Santa Catarina, Brazil. In 2000, this municipality had a population of approximately 343,047 inhabitants. Of these, 28,816 were older adults (11,979 men and 16,837 women), corresponding to 8.4% of the entire population. Approximately 98% of the population lived in urban residences.[19]

At the end of this study, there were 33 community groups for the elderly in the 12 districts of Florianópolis. These groups were mainly attended by women (2,261 women and 246 men) aged 65 or older. Adults ≥60 years who agreed to participate were included in the study. Subjects with cognitive deficits that prevented participation in the interview, physical immobility, or who were under bed restriction caused by a debilitating disease were excluded.

Two databases derived from previous studies[20,21] were used for the selection of the sample. These databases were reorganized to analyze the PA of the older adults participating in community groups. Probabilistic, stratified random sampling was used. The sample was stratified by both gender and age[21] and by age alone,[20] and the sample size was calculated using a formula for adjusting the sample.[22] The primary sampling units were census sectors defined by the Brazilian Institute of Geography and Statistics[21] and municipal districts.[20] The secondary sampling units were the community groups existing in Florianópolis in 2002.[20]

The sample of 1,062 older adults was divided into two groups (Figure 1): subjects who regularly participated in community groups, hereafter referred to as participants (n = 293, 27.6%), and subjects who did not, hereafter referred to as non-participants (n = 769, 72.4%). The study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Ethics Committees of Universidade Federal de Santa Catarina (protocol 051/2001) and Universidade do Estado de Santa Catarina (protocol 95/2007).
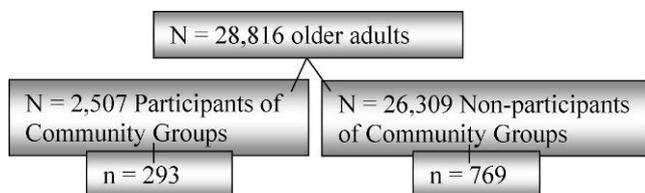

Figure 1 - Population and sample.

Instruments

Sociodemographic data were collected using a diagnostic questionnaire. The dependent variable, PA level, was evaluated using the long version of the International Physical Activity Questionnaire (IPAQ), which was administered by interview and represented an average week. The total PA level and the different domains of the IPAQ (leisure time, domestic, transportation, and work) were evaluated. Inactive behavior was defined as the sum of time spent sitting on a normal weekday and the time spent sitting on a normal weekend day. The subjects were classified as either active or inactive according to these criteria.

Statistical analysis

The data were analyzed using the SPSS 15.0 software program (SPSS, Chicago, IL, USA). Descriptive statistics were calculated (absolute and relative frequency, confidence interval, mean, and standard deviation). The Mann-Whitney test was used to compare groups and the chi-square test to evaluate the association between variables. A 95% confidence interval was adopted.

Univariate Poisson regression analysis was used to estimate the prevalence ratio between participation in community groups and being more physically active, with ''participation in community groups'' (0 = no, 1 = yes) as an independent variable and physical activity in each of the analyzed PA domains as dependent variables. The PA level quantified in all domains was classified as 0 (not very active) or 1 (very active) using a cut-off point of 150 min/week of at least moderate PA, corresponding to activities that require moderate physical effort and cause you to breathe somewhat harder than normal.[23] The work-related domain was not analyzed because most of the subjects were retired, and PA at work was rarely reported. Next, the sample was divided into the following categories to determine whether the association between the two main variables of this study would persist: gender (male and female); age (0 = <70 years and 1 = ≥70 years); BMI (0 = underweight/normal and 1 = overweight/obese), and self-reported health status (0 = poor/very poor and 1 = excellent/good).

RESULTS

Characterization of the participants

Table 1 shows the characteristics of the older adults. The mean age was similar in community group participants (72.5±6.4 years) and non-participants (71.7±8 years). Most participants were women whose maximum educational level was elementary school and who lived without a partner. In contrast, the proportion of men with an elementary school education level who lived with a partner was higher among non-participants. The BMI distribution was similar in the two groups, and the prevalence of a poor health status was higher among non-participants. An association was observed between participation in community groups and gender, age, educational level, marital status, health status, and the PA domains (total, leisure time, transportation, and domestic).

With respect to the total PA level, 66.6% of the older adults participating in community groups and 58.4% of non-participants achieved the recommended level of at least 150 min/week. In the other domains, most subjects were classified as not very active (performing less than 150 min PA/week). Older adults who participated in community groups spent significantly more time engaging transportation

Table 1 - Sociodemographic characteristics, health status, body mass index, and physical activity level of older adults participating in community groups and those who do not.

Characteristics	Participants (n = 293) n (%)	Non-participants (n = 769) n (%)	Total n (%)	χ2	p-value
Gender*				170.39	<.001
Male	27 (6.2)	410 (93.8)	437 (100)		
Female	266 (42.6)	359 (57.4)	625 (100)		
Age (years)*				10.48	.001
60-69	103 (22.5)	355 (77.5)	458 (100)		
≥70	190 (31.5)	414 (68.5)	604 (100)		
Educational level**				23.92	<.001
Up to elementary school	251 (35.1)	464 (64.9)	715 (100)		
High school or higher	29 (12.8)	197 (87.2)	226 (100)		
Marital status*				67.55	<.001
With a partner	103 (17.5)	486 (82.5)	589 (100)		
Without a partner	190 (40.2)	283 (59.8)	473 (100)		
Health status*				19.11	<.001
Poor/very poor	50 (17.6)	234 (82.4)	284 (100)		
Excellent/good	243 (31.2)	535 (68.8)	778 (100)		
BMI*				0.0	.992
Underweight/normal	120 (27.8)	311 (72.2)	431 (100)		
Overweight/obese	173 (27.4)	449 (72.6)	631 (100)		
Total PA*				5.92	<.015
Not very active	104 (24.8)	315 (75.2)	418 (100)		
Very active	189 (29.4)	454 (70.6)	644 (100)		
Leisure-time PA*				5.24	.022
Not very active	199 (25.7)	576 (74.3)	775 (100)		
Very active	94 (32.7)	193 (67.3)	287 (100)		
Domestic PA*				37.97	<.001
Not very active	183 (22.8)	620 (77.2)	803 (100)		
Very active	110 (42.5)	149 (57.5)	259 (100)		
Transportation PA*				12.77	<.001
Not very active	261 (29.9)	613 (70.1)	874 (100)		
Very active	32 (17)	156 (83)	188 (100)		
Work PA*				0.58	.443
Not very active	278 (27.8)	720 (72.2)	998 (100)		
Very active	15 (23.4)	49 (76.6)	64 (100)		

BMI: body mass index; PA: physical activity.
*Total (n = 1062).
**Total (n = 941) due to missing data.

PA and sitting on average, whereas non-participants spent more time engaging in leisure-time PA on average (Table 2).

Association between participation in community groups and physical activity

Table 3 shows the results of univariate Poisson regression analysis for the sample as a whole and according to age, health status, gender, and BMI. No association between participation in community groups and the total PA level was observed in the sample as a whole. In contrast, there was a significant association between these two variables in the group of subjects <70 years of age and among women, with adults <70 years of age and women who participated in community groups being characterized by a higher probability of being more physically active than those not participating in these groups.

Table 2 - Time spent on physical activities and time spent sitting during a normal week for older adults participating in community groups and those who do not.

Physical activity	Participants (n = 293)		Non-participants (n = 769)		p- value***
	Md	Interquartile range	Md	Interquartile range	
Total*	225	390	220	410	.072
Leisure time*	0	78	0	150	.022#
Domestic*	0	178	0	120	.168
Transportation*	80	180	30	120	<.001#
Work*	0	0	0	0	.743
Time spent sitting**	570	273	540	246	.003#

*Minutes per week.
**Time spent sitting on a weekday + time spent sitting on a weekend day (min/day).
***Mann-Whitney test.
#Significant difference (p<0.05). Md = Median.

Table 3 - Association between participation in community groups and physical activity levels in the sample as a whole and according to group.

Physical Activity	Total sample (n = 1062)	Age groups		Health status groups		Gender groups		BMI groups	
		≤70 years (n = 458)	>70 years (n = 604)	Poor (n = 284)	Good (n = 778)	Men (n = 437)	Women (n = 625)	Underweight/ normal (n = 431)	Overweight/ obesity (n = 631)
Total:									
Participants	1	1	1	1	1	1	1	1	1
Non-participants	1.03	1.07	1.01	1.01	1.03	0.99	1.05	1.03	1.04
	(0.99-1.07)	(1.01-1.13)	(0.95-1.06)	(0.92-1.11)	(0.99-1.08)	(0.88-1.11)	(1.00-1.10)	(0.96-1.09)	(0.99-1.09)
	$p = .096$	$p = .023^*$	$p = .814$	$p = .861$	$p = .113$	$p = .900$	$p = .05^*$	$p = .421$	$p = .126$
Leisure time:									
Participants	1	1	1	1	1	1	1	1	1
Non-participants	0.94	0.99	0.90	0.92	0.94	1.01	0.92	0.92	0.96
	(0.90-0.98)	(0.92-1.06)	(0.85-0.96)	(0.84-1.01)	(0.89-0.99)	(0.88-1.16)	(0.88-0.97)	(0.86-0.98)	(0.90-1.01)
	$p = .006^*$	$p = .703$	$p = .001^*$	$p = .070$	$p = .013^*$	$p = .881$	$p = .003^*$	$p = .008^*$	$p = .139$
Domestic:									
Participants	1	1	1	1	1	1	1	1	1
Non-participants	1.06	1.10	1.03	1.11	1.05	0.97	1.09	1.05	1.06
	(1.01-1.11)	(1.02-1.18)	(0.97-1.09)	(0.99-1.23)	(0.99-1.10)	(0.85-1.10)	(1.03-1.15)	(0.98-1.13)	(0.99-1.12)
	$p = .016^*$	$p = .009^*$	$p = .317$	$p = .064$	$p = .079$	$p = .662$	$p = .002^*$	$p = .153$	$p = .065$
Transportation:									
Participants	1	1	1	1	1	1	1	1	1
Non-participants	1.08	1.08	1.07	1.07	1.07	0.96	1.09	1.11	1.06
	(1.03-1.13)	(1.01-1.16)	(1.01-1.14)	(0.96-1.19)	(1.02-1.13)	(0.85-1.08)	(1.03-1.15)	(1.03-1.19)	(0.99-1.12)
	$p = .002^*$	$p = .032^*$	$p = .032^*$	$p = .223$	$p = .007^*$	$p = .475$	$p = .002^*$	$p = .005^*$	$p = .065$

Results are reported as crude prevalence ratios (95% confidence interval).
*Significant at $p<.05$.

With respect to the leisure-time PA domain, older adults participating in community groups presented a lower probability of being physically active during leisure time. When the analysis was performed according to group, this association remained significant only in the group of subjects ≥70 years of age, subjects with a good health status, women, and subjects with a normal weight. Analysis of the domestic PA domain showed that older adults participating in community groups were more likely to be physically active than non-participants. This association remained significant only in the group of subjects <70 years of age and in women. Finally, an association was also observed between participation in community groups and being more physically active in the transportation domain, which was no longer significant in the group of subjects with a poor health status and in men.

DISCUSSION

The prevalence of physically active older adults observed in the two groups (participants in community groups: 66.6%; non-participants: 58.4%) was similar to that reported in a previous study conducted on older Brazilian adults.[8] In addition, the prevalence of older adults who were active during their leisure time was similar to that reported for older Canadian adults (30%)[11] and lower than that observed for users of health care plans in Brazil (46% for men and 43% for women).[1] However, different criteria and instruments were used in these studies.

Analysis of the sample as a whole showed that older adults participating in community groups presented a higher probability of being more physically active in the domestic and transportation domains. With respect to social context, a more diversified social network and relationships with friends and neighbors have consistently been associated

better daily PA scores in older Israeli adults.[13] In this respect, community groups probably assume the role of a social network. Shye et al.[24] investigated the effect of social network size on mortality risk and observed a protective effect of a larger social network. Physical activity has also been shown to protect older Japanese adults against overall mortality and mortality due to cardiovascular diseases.[25] These results indicate that both social networks and PA are important factors for longevity.

With respect to the total PA level, an association between participation in community groups and being more physically active was only observed for adults <70 years of age and women. An association between PA and younger age has been previously reported.[1,6-8] However, studies have shown that men are more physically active in old age compared to women.[1,26,27]

In the leisure-time domain, older adults participating in community groups were less likely to be physically active. It is possible that the community group represents the leisure activity of these subjects. Thus, there is a need to encourage PA in these pre-established groups through integrative activities, such as dancing and competitions.

Older adults participating in community groups were more likely to be physically active regarding domestic tasks than non-participants. This association remained significant only in subjects <70 years of age and in women and can be explained by the traditional gender role that is still predominant in this population.[28] Furthermore, the present results suggest that participation in community groups is an essentially female practice, as few men participate in these groups. Another Brazilian study also showed a predominance of women in these groups (86.3%), including widows (49.7%), women in the age range of 65 to 74 years (65.5%), and those with an elementary school education (45.7%).[29] It was not the objective of the present study to determine why

women participate more frequently in community groups, but the female bias among older individuals may be one reason. For example, female widowhood represents a possible explanation for this pattern because men in Brazil tend to remarry and are more reluctant to engage in cultural, educational, or playful activities.[30,31]

Finally, an association was also observed between participation in community groups and being more physically active in the transportation domain. This association was no longer significant in the group of subjects with a poor health status and in men. In general, health problems are not an obstacle to PA.[6,11,32] In contrast to the present results, a Swedish study reported no marked variation in the proportion of subjects with low PA level as a function of health status.[10] In a study performed by Borges et al.,[29] older adults participating in community groups were found to present a good or very good health status, whereas Lima-Costa et al.[33] observed in a population-based sample study that most of older adults referred a regular health status and those with lower household income presented worse health conditions. With respect to the lack of a significant association being found among men, one hypothesis is that they are more dependent on motor vehicles for transportation, as men more frequently have a driver's license and continue driving in old age compared to women.[34,35]

This study demonstrated an association between participation in community groups and PA level (total, leisure time, transportation, and domestic tasks). However, the cross-sectional design of the study did not permit a determination of whether participation in community groups facilitates engagement in physical activity or whether being physically active favors participation in these groups. Longitudinal studies are needed to establish whether participation in community groups has health benefits by facilitating PA habits. Furthermore, it would be interesting to investigate this association in different countries and among various cultural backgrounds.

The project was conducted at Centro de Ciências da Saúde e do Esporte (CEFID), Universidade do Estado de Santa Catarina (UDESC) and Centro de Desportos (CDS), Universidade Federal de Santa Catarina (UFSC), Florianópolis, Santa Catarina, Brazil.

AUTHOR CONTRIBUTIONS

Mazo GZ and Sacomori C were responsible for the project development, collection and management of data, and manuscript writing. Benedetti TB was responsible for the project development, collection and management of data, and manuscript editing.

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