

Prevalence of and factors associated with leisure-time physical activity in older adults from seven Brazilian cities: data from the FIBRA study

Prevalência e fatores associados à atividade física no lazer em idosos residentes em sete localidades do Brasil: dados do Estudo Fibra

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ABSTRACT

Leisure-time physical activity (LTPA) is an important factor in promoting and maintaining adequate health status and quality of life in old age. Here we aimed to identify the prevalence and factors associated with different modalities of LTPA among 3,478 older adults (mean age: 72.96 ± 6.01 years; 67.7% female) from seven cities of different regions of Brazil. We compared categorical variables (gender, age and family income) between groups using the Chi-square test or Fisher's exact test. Walking was the most commonly reported activity undertaken by participants (43.4%). Men reported performing a larger number of LTPA modalities than women. Outdoor gymnastics and water gymnastics were the most commonly cited LTPA by women. Younger age and higher income correlated with higher levels of physical activity. Our findings indicate that a physically active behavior is closely related to the living conditions, social roles and physical health of this population. Thus, public policies encouraging LTPA among older adults should take their gender, age and social status, as well as the type of activities to be offered, into consideration.

KEYWORDS

Exercise; Motor Activity; Health of the Elderly; Gender and Health; Income.

RESUMO

A atividade física no lazer (AFL) é reconhecida como um importante fator de promoção e manutenção de adequados níveis de saúde e qualidade de vida na velhice. Este trabalho teve como objetivo identificar a prevalência e fatores associados à prática de diferentes modalidades de AFL em 3478 idosos (72,96±6,01 anos e 67,7% mulheres) residentes em sete localidades de diferentes regiões brasileiras. Foram realizadas análises de comparação das variáveis categóricas entre gênero, faixa etária e renda familiar por meio do teste Qui-Quadrado ou Exato de Fisher. A caminhada foi a atividade física mais relatada pelos idosos (43,4%). Homens relataram praticar mais modalidades. Entre as mulheres, a ginástica fora de casa e a hidroginástica foram as mais citadas. Aqueles com menos idade e com renda mais elevada também foram mais ativos. Isto demonstra que o comportamento fisicamente ativo está intimamente ligado às condições de vida, aos papéis sociais e à saúde física desta população. As políticas públicas de fomento deste comportamento devem considerar o gênero, a idade e a condição social de cada praticante e também de refletir sobre o escopo de atividades ofertadas.

PALAVRAS-CHAVE

Exercício; Atividade motora; Saúde do idoso; Gênero e Saúde; Renda.

INTRODUCTION

The concept of ‘activity’ refers to the entire set of actions that an individual takes during a day. These actions range from the simplest activities performed to satisfy physiological needs, like eating, sleeping and looking after personal hygiene, to more complex activities involving instrumentality in the physical and social environment, productivity, the enjoyment of life’s pleasures, and personal relationships.¹

Activities may be classified according to the level of physical effort required to perform them. The term ‘physical activity’ (PA) refers to a broad concept that encompasses all activities voluntarily exerted by skeletal muscles that result in more energy expenditure than rest.^{2,3} PA can be performed in different contexts: at work, while commuting to work or home, during work breaks, while carrying out household chores, or during leisure time. ‘Global physical activity’ is a measure that has been used in several studies⁴⁻⁶ to assess the level of physical activity that occurs in all of four of these contexts. There is, however, a strong tendency to assess level of physical activity by looking at the regular practice of physical exercise and sports. This measure or index includes a group of activities that differ with regard to their systematization, structure and the purpose with which they are conducted; it is called ‘leisure-time physical activity’.²⁻⁶

Leisure-time physical activity (LTPA) is an important factor in promoting and maintaining adequate health status and quality of life in old age.^{3,7} Official bodies recommend that the classification and quantification of PA for the promotion of health and quality of life be made based on the performance of physical exercise. This increases the importance of activities performed in a leisure-time context.⁷ Physical activities in general are seen as representing behavior that is protective of physical health and that wards off the deleterious effects of biological aging.^{3,7-10}

An aggravating factor in aging is the loss of social roles. Events of this nature, such as retirement, can lead to a decrease in a person’s opportunities to engage in PA, due to a reduced number of contexts in daily life. As a result, this age group is characterized as that with the lowest levels of PA performed in all contexts.¹¹ This increases the importance of implementing public policies for the promotion of LTPA among older adults.

The Brazilian literature in general indicates that older men and younger adults, as well as older people with higher socioeconomic status are more active during leisure time than their peers, and that the most prevalent and affordable activity engaged in is walking, followed at some distance by different types of gymnastics.¹²⁻¹⁶ This indicates that social issues and roles have a significant impact on this index.¹²⁻¹⁶ There is a need for studies to investigate how these sociodemographic variables affect older adults’ LTPA engagement patterns in different regions of Brazil. Understanding the relationship between older people’s engagement in different modalities of LTPA and independent variables such as gender, family income and age will help to better plan and implement social policies with this objective.

This study aimed to identify the prevalence and factors associated with different modalities of LTPA among older adults from seven cities of different regions of Brazil.

METHODS

This study analyzed the electronic database of a descriptive, cross-sectional, population-based study called FIBRA. The study project was previously submitted to and approved by the Ethics Committee for Research with Human Beings of the Faculty of Medical Sciences, State University of Campinas (Opinion number 208/2007). FIBRA is an acronym that stands for “Frailty in Older Brazilians”. It designates a research network dedicated to: identifying fragility conditions in urban older adults (aged 65 years or older) recruited from the community; investigating the relationship between frailty indices and demographic and socioeconomic variables, certain aspects of physical health and cognition, performance of daily living activities, care expectations, depressive symptoms and life satisfaction. This network was organized into four research centers, in each of which the work of a group of partner institutions was conducted. A number of cities, districts or sub-districts were selected by convenience to form the samples of each research center. This selection process was carried out in accordance with the requirements of the Brazilian National Council for Scientific and Technological Development (CNPq), which determined that a more experienced research group on aging should contact other less experienced groups - preferably from the North and Northeast of the country - to participate in the study (Edict MCT-CNPq/MS - SCTIE-DECIT, 17/2006).¹⁷

The research center of the State University of Campinas included the following cities: Campinas (São Paulo), Belém (Pará), Parnaíba (Piauí), Campina Grande (Paraíba), Pocos de Caldas (Minas Gerais) and Ivoti (Rio Grande do Sul), as well as the sub-district of Ermelino Matarazzo in São Paulo. The partner institutions of the State University of Campinas (Unicamp) were: the State Department of Public Health of Pará (SESPA); the Federal University of Piauí (UFPI); the Federal University of Campina Grande (UFCG); the State University of Paraíba (UEPB); the Pontifical Catholic University of Minas Gerais in Pocos de Caldas (PUC MG); the School of Arts, Sciences and Humanities of the University of São Paulo (EACH/USP) and the Feevale Foundation in Novo Hamburgo (Rio Grande do Sul).¹⁷

Sampling and participants

Simple random sampling was carried out in the urban census tracts of each city (Brazilian Institute of Geography and Statistics. [Http://www.ibge.gov.br](http://www.ibge.gov.br)). The sample number corresponded to the ratio of the number of older adults to the number of urban census tracts. There were 90 urban census tracts in Campinas, 93 in Belém, 75 in Pocos de Caldas, 62 in Ermelino Matarazzo, 60 in Campina Grande, 60 in Parnaíba and 27 in Ivoti. Quotas of men and women aged 65-69 years, 70-74 years, 75-79 years and 80 years or older were estimated according to the proportion of distribution of these groups among the urban older population from each city. The minimum estimated sample size in Campinas and Belém (which have over 1 million inhabitants) was 601 older adults. Sampling error was 4%.

For the other cities, which have less than 1 million inhabitants, the estimate sample size was 384 older adults. Sampling error was 5%. In Ivoti, the estimate sample size was 235 participants (from a total of 646 older adults). This

number was calculate according to a finite population correction factor, with alpha set at 5% and a sampling error of 5%.¹⁷

Trained recruiters visited each census tract (following a pre-planned sequence) in search of residents aged 65 years or older who were willing to participate in the study. Exclusion criteria were: occurrence of memory problems, attention difficulties, spatial and temporal orientation or communication problems suggestive of cognitive impairment; permanent or temporary inability to walk without the use of an assistive apparatus; localized loss of strength and/or aphasia due to stroke; severe impairment of motor skills, speech or intellec associated with advanced Parkinson's disease; severe auditory and visual deficits; and being in a terminal stage of illness The final study sample was constituted of seven citites, totaling 3,478 older adults (67.7% female) aged 65-101 years (mean: 72.96 ± 6.01). 34.6% of participants were aged 65-69 years; 30.5% were 70-74 years old; 19.7% were 75-79 years old and 15.2% were 80 years or older.

Prior to data collection, all participants were informed about the study conditions and goals of the study (the voluntary nature of participation, the possibility of abandoning the study at any time, the confidentiality of the information collected, the absence of risks to health) and gave written consent. The informed consent form was also approved by the Ethics Committee for Research with Human Beings of the Faculty of Medical Sciences, State University of Campinas (opinion 208/200717)

Instruments and measures.

Age, gender and family income. These variables (date of birth, gender and gross family income) were self-reported by participants and written down on the study form by the researchers. Family incomes were grouped according to the number of Brazilian minimum wages (MW) per month as follows: ≤ 1 MW; 1.1 to 3 MW; 3.1 to 5 MW; 5.1 to 10 MW, and > 10 MW. Participants were divided into four age groups: 65-69 years; 70-74 years; 75-79 years; and 80 years or older.

Leisure-time physical activity

The assessment of LTPA was made according to participants' self-report of weekly frequency and duration of physical activity and the weekly frequency and duration of PA undertaken in the previous week. Respondents were interviewed using a questionnaire derived from the Minnesota Leisure Time Activity Questionnaire (MLTAQ)¹⁸, which was translated and adapted into Portuguese by Lustosa et al.¹⁹ For the purposes of this study, the items of the aforementioned instrument were adapted in content, wording and sequence. In order to adapt the questionnaire, we took into consideration the information provided in a pilot study on the low frequency of response to most of the items of the original version of the questionnaire, the excessive detail of some items, the presence of questions that do not reflect the reality of most Brazilian older adults, and the time required to administer the questionnaire, which was considered to be too long, causing fatigue and disinterest in respondents. We kept items that described activities commonly performed by older adults in Brazil, and added open questions about other activities that had not been included in the MLTAQ, but might be practiced by older adults.

In addition to these changes, we also included questions on the frequency and duration of PA, in order to enrich the information collected about the regularity of practice of PA. We added questions asking participants about the engagement in PA during the past year, the number of months during which they had practiced PA and whether they had practiced PA in the last 15 days. Fifteen items of this adapted instrument were used to assess physical activity (walking, cycling, ballroom dancing, gymnastics, stretching, yoga, Tai Chi or a similar exercise (at home, in gyms or clubs); mild or vigorous jogging, weight training, swimming in a pool, river, lake or at the beach, volleyball and soccer). There were two open questions asking respondents to state whether they practiced any other PA or sports that had not yet been mentioned in the previous questions.

Closed questions had to be answered with yes or no. Each dichotomous response was followed by other questions about their continuity in time (whether the participant had engaged in these activities in the last two weeks, and in the last 12 months, and how many months in the year), their weekly frequency (how many days in a week) and their duration (how many minutes per day). The two open questions were also followed by the same questions about continuity, frequency and duration.

The profile of the sample population according to the categorical variables analyzed in this study (gender, age and family income) are shown in absolute (n) and relative (%) terms and presented in tables. We compared categorical variables (gender, age and family income) between groups using the Chi-square test or Fisher's exact test (for values lower than 5).

RESULTS

Table 1 shows the frequencies and percentages of the study variables (city, gender, family income in minimum wages, and age group).

Walking was the most commonly reported activity undertaken by participants (43.4%), followed by home gymnastics (19.5%) and outdoor gymnastics (14.3%). Table tennis (0.2%), volleyball (0.7%) and vigorous jogging (1.3%) were the least reported activities.

Men reported greater engagement in activities such as walking, cycling, mild and vigorous jogging, weight training, swimming at the beach, in a river or lake ($p < 0.001$), when compared to women. The performance of outdoor gymnastics and water gymnastics was most commonly reported by women than by men ($p < 0.001$).

We found a positive association between increasing age and decreased participation in PA such as walking, cycling, outdoor gymnastics, mild jogging, swimming and soccer ($p < 0.001$).

Family income was also associated with engagement in physical activity by older adults. Overall, there was a positive association between higher income and higher engagement in LTPA. We identified a significant association between eight of the thirteen modalities analyzed ($p < 0.001$). Older adults with a family income higher than 10 Brazilian minimum wages showed greater engagement in all modalities for which a significant association was found.

TABLE 1 – Absolute and relative frequency distribution of the characteristics of the sample population (n = 3478). FIBRA study, UNICAMP. Older people, 2008-2009.

Variables	Category	Frequency	Percentage
City	Campina Grande (PB)	403	11.6
	Ermelino Matarazo (SP)	384	11.0
	Campinas (SP)	900	25.9
	Poços de Caldas (MG)	389	11.2
	Ivoti (RS)	197	5.7
	Parnaíba (PI)	484	13.9
	Belém (PA)	721	20.7
Gender	Male	1125	32.3
	Female	2353	67.7
Family Income (Minimum wage)	0.0 – 1.0	380	10.9
	1.1 – 3.0	1467	42.2
	3.1 – 5.0	617	17.7
	5.1 – 10.0	333	9.6
	> 10.0	172	4.9
Age group	65-69	1207	34.7
	70-74	1056	30.4
	75-79	687	19.8
	80 or older	528	15.2

TABLE 2 – Absolute and relative frequency distribution of the sample population according to gender. FIBRA study, UNICAMP. Older people, 2008-2009.

Modality	Total		Men		Women		P*
	n	%	n	%	n	%	
Walking	1479	43.4	568	51.2	911	39.6	p<0.001
Cycling	178	5.2	157	14.2	21	0.9	p<0.001
Dance	284	8.3	98	8.8	186	8.1	P=0.467
Home gymnastics	666	19.5	213	19.2	453	19.7	P=0.747
Outdoor gymnastics	487	14.3	82	7.4	405	17.6	p<0.001
Water gymnastics	199	5.8	28	2.5	171	7.4	p<0.001
Mild jogging	200	5.9	88	7.9	112	4.9	p<0.001
Vigorous jogging	45	1.3	22	2.0	23	1.0	P=0.024
Weight training	125	3.7	60	5.4	65	2.8	p<0.001
Swimming	72	2.1	29	2.6	43	1.9	P=0.163
Swimming at the beach, in a river or lake	97	2.8	58	5.2	39	1.7	p<0.001
Volleyball	28	0.8	11	1.0	17	0.7	P=0.544
Table tennis	7	0.2	7	0.6	0	0.0	NA
Soccer (men only)	29	3.6					NA

* Chi-square test or Fisher's exact test. NA = not applicable

TABLE 3 – Percentage of “yes” responses to each of the modalities reported by participants, according to family income (in minimum wages) and age group. FIBRA study, UNICAMP. Older people, 2008-2009.

Family income	Modality													
	Walking	Cycling	Dance	Home gymnastics	Outdoor gymnastics	Water gymnastics	Mild jogging	Vigorous jogging	Weight training	Swimming	Swimming at the beach, in a river or in a lake	Volleyball	Table tennis	Soccer
0.0–1.0	39.8	4.1	6.2	17.1	9.2	3.3	6.3	2.4	2.4	1.1	2.7	0.3	0.0	1.2
1.1–3.0	39.8	5.5	8.0	19.1	13.2	5.1	5.1	1.3	2.7	1.9	2.9	0.8	0.1	2.9
3.1–5.0	49.8	5.0	8.1	20.6	16.3	6.3	7.0	1.7	3.8	2.3	3.0	0.3	0.3	3.6
5.1–10.0	49.8	4.5	9.1	19.0	16.9	8.5	7.3	0.6	4.5	3.0	2.1	1.2	0.0	2.3
> 10.0	55.6	4.1	12.9	26.9	18.7	12.3	7.6	1.2	10.5	5.3	4.7	2.9	1.2	8.8
P*	p<0.001	p<0.761	p<0.125	p<0.093	p<0.003	p<0.001	p<0.302	p<0.0290	p<0.001	p<0.023	p<0.611	p<0.009	p<0.042	p<0.036
Age group	Walking	Cycling	Dance	Home gymnastics	Outdoor gymnastics	Water gymnastics	Mild jogging	Vigorous jogging	Weight training	Swimming	Swimming at the beach, in a river or in a lake	Volleyball	Table tennis	Soccer
65–69	45.7	6.6	8.3	18.1	17.0	6.1	6.7	1.8	4.2	2.9	3.9	1.3	0.2	5.9
70–74	45.7	4.9	9.4	19.8	14.3	5.9	6.7	1.2	3.4	1.8	2.3	0.7	0.3	2.5
75–79	41.8	5.5	8.3	20.5	13.4	6.4	5.1	1.2	3.7	2.2	2.4	0.4	0.3	1.0
80 or older	35.5	2.3	6.2	20.8	9.3	4.4	3.3	0.6	2.9	0.8	2.1	0.6	0.0	3.0
P*	p<0.001	p<0.003	p<0.190	p<0.473	p<0.001	p<0.507	p<0.019	p<0.173	p<0.568	p<0.045	p<0.074	p<0.204	p<0.615	p<0.009

* Chi-square test or Fisher's exact test.

DISCUSSION

This study aimed to analyze the patterns of responses to a survey about leisure-time physical activity among older adults from seven Brazilian cities. Our goal was to identify the scope of activities reported by older adults and how sociodemographic variables are associated with their reports. We are aware of the limitations inherent to a study based on self-reports. It is not possible to ascertain the veracity of the statements. These limitations, however, do not diminish the importance of our findings.

In line with other studies, we found that walking was the most commonly reported activity undertaken by older ^{14,20,21} and younger adults^{22,23}, followed by the types of gymnastics activities (at home and outdoors) questioned in this study. Of note, several of the activities questioned had a low frequency of positive responses. Walking, home gymnastics and outdoor gymnastics were the only activities that had a percentage of positive responses over 10%. In a study on LTPA in a population aged 20-60 years, Salles-Costa et al have found that seven of the twelve modalities questioned reached a percentage of positive responses over 10%.²³ This suggests a restriction of the scope of PA modalities practiced by older adults, when compared to younger populations, which is probably due to the fact that walking and gymnastics are the two activities that are most commonly offered to older adults in the context of public policies.²⁴

Gender was the variable that most affected participants' answer pattern. Overall, males had higher levels of physical activity and were the significant

majority of positive respondents for many of the modalities analyzed here. This finding is consistent with other findings that show that men tend to be more active than women in the context of leisure.^{14,16,25} Similar to a study conducted by Venturi et al²⁰, we found that the performance of outdoor gymnastics and water gymnastics was most commonly reported by women. These findings suggest that these difference in the engagement in LTPA are not only the result of social roles, but also of different social conventions and body ideals of men and women, as highlighted by Salles-Costa et al.²³

Family income unilaterally affected participants' answer pattern. Participants with a family income above ten minimum wages were the majority among those who responded positively to the questions concerning all modalities for which a significant association was noted. Even walking, an activity considered to be widely accessible to all social classes, was most commonly reported by participants with higher incomes. In general, the literature shows that people with more financial resources are more physically active during leisure time^{12,13,16}, because they have greater access to services and information or live in environments that favor the practice of PA.²⁶

Older age was also a factor that highly affected participants' answer pattern. There was a significant association between age and positive responses for all PA modalities except soccer, for which the oldest age group was not the one to give the lowest number of positive responses. A decrease in PA levels - both in global^{12,16} and leisure-time PA¹³ - is expected with increasing age. Nevertheless, our findings indicate that younger adults are favored when it comes to the offer of PA modalities.

LTPA is an important parameter for the analysis of population's engagement in PA. In this study, walking was the most commonly reported activity undertaken by participants, and men were found to be more physically active than women. Outdoor gymnastics and water gymnastics were the most commonly cited LTPA by women. Younger age and higher income correlated with higher levels of physical activity. Our findings indicate that a physically active behavior is closely related to income-associated living conditions, gender-associated social roles and age-associated physical health issues.

The findings of this study corroborate the data already reported in the literature. The wide territorial scope of the study, which included a sample of older adults from five macro-geographical regions of Brazil serve to further enhance these findings.

Finally, there is a clear need for public policies encouraging LTPA among older adults. Nevertheless, these policies should take the gender, age and social status of participants into consideration. It is also necessary to reflect on the scope of activities offered, in order to increase the possibility of engaging in physical activities that promote good social interaction and protect the health of individuals.

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