Active aging: prevalence and gender and age differences in a population-based study

Envelhecimento ativo: prevalência e diferenças de gênero e idade em estudo de base populacional

Envejecimiento activo: prevalencia y diferencias de género y edad en estudio de base poblacional

Neuciani Ferreira da Silva Sousa [1]
Margareth Guimarães Lima [2]
Chester Luiz Galvão Cesar [3]
Marilisa Berti de Azevedo Barros [2]

Abstract

The aim of this study was to analyze prevalence rates and gender and age differences in indicators of active aging in elders participating in the Campinas Municipal Health Survey *in Campinas, São Paulo State, Brazil (2014-2015). We estimated prevalence rates for participation by the elderly in twelve activities pertaining to four dimensions and calculated the prevalence ratios with Poisson regression. The study population consisted of 986 elderly. The results showed that 40.2% of the elderly participated in sociocultural activities, 25.3% were physically active in their leisure time, 21.7% used the Internet, 22.1% performed paid work, and only 2.6% were taking courses. In the social dimension, the only gender difference was in religious practice, which was less prevalent in men (PR = 0.67). In the dimension of physical activity, men were more active at work (PR = 2.10), in commuting (PR = 1.61), and in their leisure time (PR = 1.44). There was no gender difference in the intellectual dimension, and men were more active in paid work (PR = 1.78). The analyses by age brackets showed that in men, only physical activity at work and paid work presented lower prevalence in the group 80 years and older. Among the oldest elderly women, lower prevalence rates were seen in six activities, which suggests a possible differential effect of advanced age between the sexes. The results show important rates of participation by elderly in some indicators of active aging, besides challenges in activities that are performed rarely and gender differences in participation.*

Aging; Health Status Disparities; Gender and Health; Aged

Correspondence
N. F. S. Sousa
Rua 217, Quadra 44, nº 5, Setor 2, Cuiabá, MT 78088-225, Brasil.
neuciani@yahoo.com.br

[1] *Instituto de Saúde Coletiva, Universidade Federal de Mato Grosso, Cuiabá, Brasil.*
[2] *Faculdade de Ciências Médicas, Universidade Estadual de Campinas, Campinas, Brasil.*
[3] *Faculdade de Saúde Pública, Universidade de São Paulo, São Paulo, Brasil.*

Introduction

Population aging is one of the most significant phenomena of the 21st century [1]. The annual growth rate of the global elderly population is approximately 3%, and it is estimated that this population will reach 2.1 billion by 2050. There are currently 962 million individuals 60 years or older in the world, representing 13% of the total population. By 2050, all regions of the world except Africa will have at least one-fourth of their populations in this age bracket [2]. In Brazil, 13% of the population is over 60 years of age [2], with the proportion expected to reach 29.3% by 2050 [3].

A phenomenon that accompanies population aging is the feminization of old age, i.e., a higher proportion of women than men in the elderly population, especially in the more advanced ages. In 2012, for every 100 women 60 years or older in the world, there were only 84 men, and for every 100 women 80 years or older there were only 61 men [1]. Despite variations between regions of the world, women comprise more than half of the elderly population in all of them [4]. However, although women tend to live longer, they experience worse quality of life than men, especially due to gender relations that structure the entire life cycle and influence access to resources and opportunities, generating continuous and cumulative impacts on social and economic life [1,5].

Women experience less protection, security, and wellbeing in old age due to various factors, featuring the higher likelihood of working in the informal sector, lower income and schooling, and more chronic and disabling diseases [1,4,6]. A major concern for men is the need to promote a culture of self-care. In addition, when elderly men retire and stop working their social support network shrinks, making them more socially vulnerable [1,7].

Given the gender differences in life-course social roles, experiences, and opportunities, a gender approach is essential for implementing active aging policies, currently acknowledged as a key strategy for responding to the revolution in population aging [8,9]. The concept of active aging adopted by the World Health Organization (WHO) applies to both societies and individuals. In societies, life-course health opportunities, participation, security, and learning should be optimized through proactive policies, which are necessary for maintaining active living. At the individual level, elderly people should be able to enjoy the opportunities provided according to their needs, capacities, and preferences. In the WHO approach, active aging is a multidimensional concept, including not only economic participation by the elderly, but also unpaid forms of participation such as formal and informal social, cultural, and leisure-time activities or those requiring physical or mental effort [8,9]. The WHO thus implicitly acknowledges the different contributions that various groups of elderly can make to society [10]. Nevertheless, little attention has been given to gender implications and other demographic and socioeconomic aspects in studies on active aging, either in the global scenario [10,11] or in the Brazilian context [12], thus leaving an entire agenda open for current research [13]. The current study thus aimed to analyze the prevalence of indicators of active aging in the elderly population in a city in Southeast Brazil, as well as gender and age differences in these indicators.

Method

This was a cross-sectional population-based study using data from the *Campinas Municipal Health Survey* (ISA-CAMP) in Campinas, São Paulo State, Brazil, for 2014-2015. The survey aimed to analyze social patterns, trends, and disparities in multiple health dimensions using home interviews. ISA-CAMP collected data from three subpopulations – adolescents, adults, and elderly – corresponding to the age groups 10-19 years, 20-59 years, and 60 years and older, residing in permanent private households in the urban area of Campinas. The current study only analyzed individuals 60 years or older.

A sample of the population was selected using a complex sampling design, starting by dividing the population in five strata corresponding to the five health districts in Campinas: east, northwest, north, southeast, and south. A two-stage cluster selection was then performed with the census tracts and households. Fourteen census tracts were selected in each stratum, totaling 70 units. To obtain the sample, estimated at one thousand elderly individuals, and considering a 20% non-response rate, 3,157 households were sampled. This number of interviews was planned to guarantee estimates of

0.50 with an error of up to five percentage points, 95% confidence interval (95%CI), and a design effect of 2. All the elderly present in each selected household were interviewed. We opted not to randomly select individuals in each sampled household because the accuracy is similar when interviewing all the elders in the household and is less costly than the design in which only one person is picked per household [14].

Data in ISA-CAMP 2014-2015 were collected with a pre-coded questionnaire containing mostly closed questions and organized in 13 thematic blocks. Data were collected by trained interviewers using a direct interview with the individual, optimized with the use of a tablet. Interviewers had received prior training to discuss the expected approach during the interviews and the details for each question in the study instrument, as well as to allow proper handling of the tablet and a full grasp of the content. All the instructions were provided in a manual.

As for the study variables, active aging was approached according to the definition established by the WHO [8] for the term "active", which relates to participation in activities with multiple dimensions (social, physical, cultural, intellectual, economic, civic, and political). Thus, among the questions available in the questionnaire, we selected those belonging to four of these dimensions [8,9], as described below:

(1) Social dimension: the elderly were asked about their participation in four domains: (a) family circle – whether they routinely received or made visits to friends and family; (b) sociocultural activities – whether they participated in activities like movies, theater, community centers, bingos, dances, and others; (c) groups or associations – volunteer work or participation in some association or sporting, cultural, charitable, political, or religious group; (d) religious practice – attendance at a place of worship once a week or more.

(2) Dimension of physical activity: estimated from questions from the *International Physical Activity Questionnaire* (IPAQ) – long version [15], which estimates the time spent per week in moderate and/or vigorous physical activities in the domains of work, commuting, household activities, and leisure. To classify the level of physical activity in each of these domains, a physical activity score was constructed in minutes per week. The score was the sum of the minutes spent in moderate activities plus the minutes spent in vigorous activities (with the latter multiplied by two). This strategy aimed to represent the different intensities of each activity, as recommended by the WHO [16]. A score greater than 150 minutes per week was defined as the cutoff to classify individuals as active in each domain.

(3) Intellectual dimension: estimated on the basis of two variables: (a) Internet use and (b) regular attendance at courses in literacy training, basic education, or higher education or courses in computers, languages, dance, and arts.

(4) Work dimension: based on participation in the following domains: (a) paid work (estimated with the question: "Do you currently do any paid work or help anyone in your family with their work?"); (b) retirees that work (elderly that are already retired but still do some form of work).

The study population was characterized by the following demographic and socioeconomic variables: sex (female or male); age bracket (60-69, 70-79, 80 and older); race/color (white, black/brown, other); conjugal status (married/in stable union, separated/divorced, widow/widower, single); religion (none, Protestant, Catholic, other); and schooling in years (0-4, 5-10, 11 or more).

For gender, the prevalence rates were analyzed for each domain of active aging, and the prevalence rates for active aging were stratified by age brackets. The proportions were compared with the Pearson chi-square test, setting statistical significance at $p < 0.05$, and using adjusted prevalence ratios and the respective 95%CI, calculated with Poisson regression.

The final weight for each individual in the sample was calculated by multiplying the design weight by the non-response weight and by the post-stratification adjustment weight. The gender and age distributions were also considered, based on the population projection by the São Paulo Data Analysis System (SEADE). The effect of the complex sampling design was considered in all the analyses, using the survey module from Stata 14.0 (https://www.stata.com).

The ISA-CAMP study was approved by the Institutional Review Board of the School of Medicine, State University of Campinas, case review n. 409.714, September 30, 2013.

Results

Of the 1,168 elderly individuals located in the households, there was a 14% refusal rate and 1.5% losses for other reasons. The study population thus consisted of 986 elderly, predominantly women (57.6%). As shown in Table 1, in both sexes, the majority of the elderly were between 60 and 69 years of age, white, and had 0 to 4 years of schooling. As for conjugal status and religion, there were statistically significant differences between the sexes in the distribution of the respective categories. For conjugal status, 76.1% of the men were married or in stable unions, as compared to only 40.7% of the women. Meanwhile, there were relatively more widows (41.1% of the women) than there were widowers (12.7% of the men). As for religion, Catholicism predominated in both sexes, but men were more likely than women to not practice any religion (10% and 2.8%, respectively).

Table 2 shows the prevalence rates for participation in activities in the four dimensions. All activities in the social dimension showed extensive participation by the elderly, varying from 23.3% (belonging to groups or associations) to 89% (visits to family). As for the dimension of physical activity, except for the leisure-time domain, with a prevalence of 25.3%, the other domains showed prevalence rates around 10%. In relation to the intellectual dimension, Internet use was reported by approximately one-fifth of the study population, while taking courses was the least frequent activity (2.6%). Prevalence of participation in paid work was 22.1% in the overall sample, but there was a low proportion of retired elderly that were still working (5.2%).

Table 2 also shows in the social dimension that only the prevalence of religious practice showed a statistical difference between the sexes, where it was lower in men (PR = 0.67). As for the physical dimension, men were more active in the work domain (PR = 2.10), commuting (PR = 1.61), and leisure time (PR = 1.44). In the work dimension, the prevalence rates of men that did some form of paid work and that were working even after retiring were higher than in women (PR = 1.78 and 2.79, respectively). No statistically significant differences were seen between men and women in the intellectual dimension.

There were distinct gender patterns in the analysis of active aging when stratified by age brackets and adjusted for conjugal status and years of schooling. For men, only 2 of the 12 activities analyzed (physical activity at work and paid work) were statistically less prevalent in elderly males 80 years or older when compared to those 60 to 69 years of age; meanwhile, no differences were observed between these age brackets in any of the activities in the social and intellectual dimensions. In addition, when the 70 to 79 year and 80 and older brackets were compared, the prevalence rates were similar for participation in all the target activities (Table 3). Meanwhile, women showed lower participation in six activities in the age bracket 80 years and older when compared to 60 to 69 years, especially in the dimension of physical activity, where all the domains showed lower prevalence rates among the oldest elderly women. When the age brackets 70 to 79 years and 80 years and older were compared, there were differences in the social dimension (sociocultural activities and volunteering/ belonging to groups or associations) and in the physical dimension (in the domain of commuting), as shown in Table 4. Without adjusting for years of schooling, Internet use (in both sexes) and participation in volunteering/associations (for women) also showed significant differences between the age brackets and were less prevalent in 80 and older bracket compared to 60 to 69 years (data not shown).

Discussion

The results showed considerable participation by the elderly in social activities and leisure-time physical activity, while also revealing less participation in intellectual activities, physical activities other than in leisure time, and in paid work. The study also identified differences between men and women in participation in activities in three dimensions of active aging. Men were more active in the work market and in the dimension of physical activity, except for household activities. Women were more active in the social dimension, especially in weekly attendance at religious services. The study's results also showed that participation in activities were more limited in women than in men in more advanced ages. This demarcation of activities based on demographic characteristics reveals the study's potential for identifying access to assets, services, resources, and rights, besides signaling hierarchical

Table 1

Socioeconomic and demographic characteristics of the population 60 years and older. Campinas, São Paulo State, Brazil, 2014-2015.

Variables	Total (n = 986)		Male (n = 387)		Female (n = 599)		p-value *
	n **	% ***	n **	% ***	n **	% ***	
Age brackets (years)							
60-69	506	56.7	212	60.0	294	54.2	**0.022**
70-79	308	28.0	122	28.5	186	27.7	
80 and older	172	15.3	53	11.5	119	18.1	
Race/Color							
White	703	71.2	271	70.4	432	71.9	0.387
Black/Brown	254	26.1	107	27.7	147	25.0	
Other	29	2.6	9	2.0	20	3.1	
Conjugal status							
Married/Stable union	516	55.7	287	76.1	229	40.7	**< 0.001**
Separated/Divorced	84	8.4	29	7.0	55	9.5	
Widow(er)	318	29.1	54	12.7	264	41.1	
Single	68	6.8	17	4.2	51	8.7	
Religion							
None	59	5.9	41	10.0	18	2.8	**< 0.001**
Protestant	257	25.9	84	21.7	173	29.0	
Catholic	623	63.8	248	65.1	375	62.9	
Other	46	4.4	14	3.3	32	5.3	
Schooling (years)							
0-4	609	57.7	223	53.1	386	61.2	0.074
5-10	164	17.8	70	19.2	94	16.8	
11 or more	213	24.5	94	27.7	119	22.1	

* * Chi-square test;

** Number of individuals in the unweighted sample;

*** Prevalence rates calculated with weighting due to the sampling design.

power relations, in which one group's privilege is related (intentionally or unintentionally) to another's oppression and disadvantage. In this sense, participation in various activities during any phase of life, and especially in old age, is not random, but historically and culturally constructed [5,6].

As for the social dimension, the study found a high prevalence of participation in all the activities, with no gender differences except for attendance at worship services. Although the results for social participation are hardly comparable between studies (since there is no consensus on terminology, study protocols, and groups of activities involved [17]), according to data from a Brazilian study [18], only 4.6% of Brazilians fifty years and older perform volunteer work. In the current study, volunteering and/or belonging to groups or associations was estimated at 23.3%, showing that opportunities for social participation have been ensured for an important share of these elders.

The study further found that religious practice is important for the Brazilian elderly, and women's greater attendance at worship services is consistent with other studies [19,20,21]. Some interpretative theories have attempted to explain the gender differences in religious practice based on physical, physiological, or social factors. In the latter case, for example, authors have suggested that the greater the female participation in activities outside the home, especially in the work market, the more women resemble men in terms of religiosity, even after adjusting for other factors that are also associated with religious practice, such as schooling, age, and conjugal status. One hypothesis is that working outside the home provides social and psychological benefits that are similar to those that can be obtained from religion, making the latter less relevant for some people in these circumstances [21]. In

Table 2

Prevalence and prevalence ratios (PR) of indicators of active aging according to gender. Campinas, São Paulo State, Brazil, 2014-2015.

Indicators	Total	Sex (%)		p-value *	Adjusted PR **,***	95%CI	Adjusted PR **,#	95%CI
		Women (n = 599)	Men (n = 387)					
Social								
Family circle	89.0	89.4	88.4	0.647	0.98	0.94-1.04	0.98	0.93-1.03
Sociocultural activities	40.2	39.0	41.8	0.412	1.05	0.88-1.24	0.98	0.82-1.17
Volunteering/Associations	23.3	24.2	22.1	0.523	0.89	0.67-1.19	0.80	0.59-1.10
Religion	47.1	53.6	38.2	< 0.001	0.70	0.60-0.82	0.67	0.57-0.78
Physical activity								
Work	9.9	6.7	14.3	< 0.001	1.97	1.41-2.77	2.10	1.45-3.03
Commuting	10.9	9.7	12.5	0.1906	1.27	0.84-1.91	1.61	1.02-2.52
Household	11.4	11.3	11.4	0.9624	0.98	0.68-1.43	1.03	0.74-1.44
Leisure	25.3	20.3	32.1	< 0.001	1.52	1.18-1.97	1.44	1.09-1.90
Intellectual								
Internet use	21.7	18.9	25.6	0.022	1.27	0.98-1.65	0.91	0.73-1.13
Courses	2.6	3.1	1.9	0.387	0.61	0.20-1.85	0.48	0.15-1.52
Work								
Paid work	22.1	16.5	29.6	< 0.001	1.66	1.31-2.11	1.78	1.40-2.25
Retired, still working	5.2	3.3	7.8	< 0.001	2.25	1.37-3.67	2.79	1.81-4.30

95%CI: 95% confidence interval.

* Chi-square test;

** Reference category: female gender;

*** Age-adjusted prevalence ratio;

Prevalence ratio adjusted for age, conjugal status, and years of schooling.

our study, even after adjusting for age, schooling, and conjugal status, women remained more active in attendance at religious services, strengthening the consensus that gender difference in religion probably stems from a complex combination of multiple factors, in which culture, religious tradition, and workforce participation play a modulating role [21].

The current study analyzed physical activity in four domains: leisure, work, household, and commuting. The analysis of physical activity according to these domains is relevant: although the benefits of regular weeklong physical activity are well-known, particularly in the context of leisure time, there is growing recognition of the need to encourage integrating physical activity into daily lifestyle in order for individuals to achieve the recommended levels [16]. However, the effects of each domain of physical activity on health may differ (it is more common to observe the pronounced beneficial effects of leisure-time physical activity on health when compared to physical activity in other domains [22]). The current study showed low prevalence of physical activity at work, at home, and during commuting when compared to the leisure-time domain. For physical activity in leisure time, the observed prevalence was similar to that in Brazil's state capitals (22.3%) [23], but more than double the rate in 2008 in a study in the same population [24] and also considerably higher than the national estimate of the elderly that are physically active in leisure time, namely 13.6% [25].

The literature has consistently reported higher rates of leisure-time physical activity in men [24,26], corroborating the current study's findings. The prevalence rates in the current study, both for men and women, are also similar to those seen in Brazil's state capitals (29.4% and 18%, respectively) [23]. Some authors have suggested that this difference may be due to a genetic predisposition to be more or less physically active [27], but any such predisposition is purportedly mediated by a series of biological, psychological, social, and environmental factors that accumulate over time and affect the later stages of life [28]. Consistent with this perspective, evidence indicates that leisure-time physical activity in

Table 3

Prevalence and prevalence ratios (PR) of indicators of active aging in men according to age brackets. Campinas, São Paulo State, Brazil. 2014-2015 (n = 387).

Indicators	Age bracket (years)			p-value *	RP ajustada **					
	60-69 (n = 212) (1)	70-79 (n = 122) (2)	≥ 80 (n = 53) (3)		PR (2/1)	95%CI	PR (3/1)	95%CI	PR (3/2)	95%CI
Social										
Family circle	89.6	86.1	88.0	0.642	0.97	0.86-1.09	0.99	0.88-1.13	1.03	0.93-1.14
Sociocultural activities	43.8	37.9	41.1	0.608	1.00	0.74-1.37	1.15	0.73-1.81	1.15	0.74-1.79
Volunteering or associations	21.8	23.7	19.5	0.835	1.20	0.75-1.92	1.01	0.47-2.16	0.84	0.44-1.59
Religion	37.6	42.3	31.0	0.427	1.13	0.82-1.55	0.89	0.55-1.43	0.79	0.49-1.28
Physical activity										
Work	20.2	4.3	8.2	**< 0.001**	**0.19**	**0.07-0.49**	**0.31**	**0.11-0.83**	1.66	0.48-5.78
Commuting	11.2	14.5	14.5	0.671	1.04	0.52-2.08	0.84	0.35-1.98	0.81	0.34-1.90
Household	12.4	9.8	10.4	0.783	0.86	0.39-1.89	0.90	0.32-2.48	1.05	0.31-3.54
Leisure-time	36.0	27.0	24.4	0.122	0.82	0.56-1.21	0.76	0.30-1.34	0.92	0.55-1.56
Intellectual										
Internet	33.7	13.7	12.4	**< 0.001**	0.63	0.39-1.02	0.70	0.41-1.20	1.10	0.59-2.04
Courses	1.9	1.2	3.7	0.597	1.07	0.16-7.06	3.03	0.45-20.48	2.84	0.38-21.29
Work										
Paid work	42.4	10.8	8.9	**< 0.001**	**0.27**	**0.16-0.45**	**0.22**	**0.08-0.64**	0.83	0.30-2.35
Retired, still working	9.3	6.2	3.6	0.342	0.72	0.37-1.41	0.42	0.06-2.80	0.58	0.09-3.58

95%CI: 95% confidence interval.

* Chi-square test;

** Prevalence ratio adjusted for conjugal status and years of schooling.

childhood and youth, plus life-course gender expectations, are the most important determinants of leisure-time physical activity in old age [29,30,31,32].

In the other domains of physical activity, we observed gender differences in physical activity at work and during commuting, both of which were more prevalent in men. As for physical activity at work, a systematic review showed that men, ethnic minorities, lower-income individuals, and blue-collar workers have higher levels of physical activity at work [33]. According to the review, this kind of physical activity can be a marker of both gender and social inequalities, and it should thus be analyzed with caution. Both the physical work activities performed by different categories of workers (executives, blue-collar workers, farm workers, and large landholding farmers, among others) and the motivations and objectives of the work activities themselves are unequal and sometimes involuntary [34]. Another systematic review [26] also found that men are more active in commuting than women. Note however that active commuting can involve unfavorable conditions such as exposure to air pollution and hazardous streets and sidewalks, a point that requires greater attention from studies on the specific effects of each domain of physical activity on health [22].

In the intellectual dimension, the results highlighted the low prevalence of Internet use in both men and women, corroborating findings from other Brazilian studies [35,36]. Although Internet use by elderly Brazilians has increased (from 12.6% in 2013 to 17.4% in 2015), 60 and older is still the age bracket with the least Internet access in the country [35,36]. The Brazilian reality differs from that of the United States, for example, where 67% of elderly report being connected to the Internet, ranging from 82% for elderly Americans 65 to 69 years of age to 44% for those 80 years or older [37]. Notably, Internet use by the oldest Americans (octogenarians and older) is already higher than in the youngest Brazilian elders in the current study, which underscores the challenge of digital inclusion in Brazil.

Table 4

Prevalence and prevalence ratios (RP) of indicators of active aging in women according to age brackets. Campinas, São Paulo State, Brazil, 2014-2015 (n = 599).

Indicators	Age bracket (years)			p-value *	PR (2/1)	95%CI	Adjusted RP **			
	60-69 (n = 294) (1)	70-79 (n = 186) (2)	≥ 80 (n = 119) (3)				PR (3/1)	95%CI	PR (3/2)	95%CI
Social										
Family circle	90.4	89.7	86.2	0.459	1.00	0.94-1.07	0.98	0.89-1.07	0.97	0.89-1.07
Sociocultural activities	44.6	40.5	19.8	< 0.001	0.99	0.80-1.22	0.52	0.34-0.80	0.53	0.33-0.84
Volunteering or associations	27.2	25.4	13.4	0.009	1.07	0.78-1.46	0.63	0.38-1.06	0.59	0.36-0.98
Religion	57.7	53.0	42.3	0.029	0.94	0.79-1.11	0.76	0.57-1.01	0.81	0.61-1.07
Physical activity										
Work	11.0	2.7	0.0	< 0.001	0.26	0.10-0.66	-	-	-	-
Commuting	12.1	9.4	2.7	0.011	0.71	0.41-1.22	0.19	0.07-0.53	0.27	0.11-0.65
Household	13.9	10.5	5.0	0.073	0.72	0.38-1.35	0.32	0.12-0.89	0.45	0.16-1.25
Leisure-time	26.2	15.2	10.4	0.003	0.65	0.39-1.08	0.49	0.27-0.90	0.76	0.36-1.60
Intellectual										
Internet	25.5	12.7	8.8	< 0.001	0.74	0.50-1.09	0.61	0.35-1.06	0.83	0.47-1.47
Course	3.4	1.8	4.3	0.572	0.80	0.19-3.31	2.24	0.57-8.81	2.81	0.54-14.53
Work										
Paid work	24.3	8.1	6.3	< 0.001	0.31	0.19-0.50	0.23	0.09-0.59	0.74	0.27-2.01
Retired, still working	3.7	3.2	2.3	0.806	0.67	0.26-1.71	0.45	0.09-2.26	0.67	0.11-4.13

95%CI: 95% confidence interval.

* Chi-square test;

** Prevalence ratio adjusted for conjugal status and years of schooling.

Since Internet use can provide key benefits for the elderly such as access to health information, cognitive stimulus, and social interaction (especially with younger users), digital inclusion policies are recommended with the elderly as priority targets [38]. Further in relation to the intellectual dimension, the study found negligible participation by the elderly in courses, corroborating a study in Juiz de Fora, Minas Gerais State, Brazil, in which this type of activity was the least frequently reported by the elderly (7.1%) [12]. This reality runs contrary to the expectations of active aging policy, in which a priority is to optimize learning opportunities, considering any form of formal or informal learning as vital for social and technological inclusion, personal and professional growth [9], and preservation of cognitive functioning.

In the work dimension, the proportion of elderly that performed paid work (22.1%) corresponds to the employment level in the elderly Brazilian population as a whole, which has shown a downward trend in recent years, from 30.2% in 2005 to 26.3% in 2015 [39]. This finding indicates that despite the growing attention in political discourses to the need to prolong individuals' working life, the opportunities for access to work by elders appear not to keep pace. It is thus necessary to expand and guarantee access to employment for older workers, with job opportunities under equal conditions with other age brackets, thus avoiding discrimination on grounds of age. It is also necessary to promote opportunities for professional development as a way of preserving the jobs of people already participating in the work market [40].

Male hegemony in the labor market, identified in this study and in other Brazilian and international research [10,41,42,43,44], both in pensioners and non-pensioners, is closely related to the traditional

family support model, in which men are the primary breadwinners, while women are left in charge of unpaid family care, resulting in their own economic dependence on men [45]. Gender disparity in the prevalence of paid work can also be explained by the countries' levels of economic and educational development [44] and by more intrinsic gender factors such as women's career interruptions to dedicate their time and work to motherhood or care for dependent relatives (which can hinder women's reinsertion in the work market), besides the difference in legal retirement age between men and women [10,46]. Although women retire earlier than men, retirement for women apparently translates in practice as definitive exclusion from the work market [47]. Thus, studies have shown that more retired men return to the labor market when compared to retired women [43,48].

As for observed gender differences in indicators of active aging according to age brackets, at more advanced ages, women participated less in activities than men. Among the oldest elderly men, participation was only lower in two activities. Meanwhile, the oldest women showed lower participation in six activities. For certain activities such as work, the proportion can be expected to decrease with advancing age in both men and women [44]. For other activities however, especially those that promote social interaction and preservation of physical and cognitive functions, this reduction is not desirable [17]. What is actually expected is an adaptation to such activities in order to respect individual needs, capacities, and preferences, which can change in each phase of old age [9]. The observed differences between men and women in active aging according to age thus merit closer attention. Since this was a cross-sectional study, it is not possible to speak of "decline" or "reduction" in activities with advancing age. The reference is actually to individuals from different birth cohorts, i.e., it is possible that the oldest elderly did not "stop doing" certain activities, but rather had never taken them up in the first place. Profound social transformations that began in the early 20th century, such as women's continuous emancipation and changes in family composition [42] have led to increasingly lower impact from traditional gender conventions with each passing generation, contributing to a gradual increase in women's participation in society throughout the life cycle and in a wide range of domains. Such transformations may be the source of the sharp differences in women when comparing those 60 versus 80 years of age, as seen in this study. Therefore, one can expect that with each new generation there will be smaller differences in the way people age, especially for women.

The study used indicators that provide an overview of the current experience with active aging, thereby helping expand knowledge on this issue. However, some limitations were identified, such as the lack of information on the actual frequency of sociocultural activities and participation in groups or associations, the reasons for (and frequency) of Internet use, and satisfaction from work. Such details are useful for understanding active aging, since activities can have different effects on health and well-being, depending on the context. Survival bias was considered as another study limitation, based on the logical error of studying elderly that survived early mortality, the latter being more common in persons with greater life-course risk exposure. Such a bias would thus tend to reduce the size of associations between study variables [49]. Meanwhile, the study strengths were the sample size (which allowed estimating most of the indicators of active aging with good precision in the target strata), high data quality, and the use of indicators that have received less attention in the elderly population, based on a multidimensional approach to active aging.

Final remarks

The study's results reveal positive aspects of active aging among the elderly in the sample, such as important participation in the social dimension and in leisure-time physical activity, with prevalence rates exceeding the national estimates for Brazil. The study further contributed to identifying activities with less participation by elderly Brazilians, such as taking courses, Internet use, and paid work, which are still challenges for active aging. The study also showed that participation in various activities in old age is intrinsically related to traditional gender roles that may be consolidated throughout the life course and are taken for granted by the time one reaches old age. In turn, this condition at least partly shapes differential access by men and women to resources, goods, and services that optimize participation in certain life domains. Finally, the study found that differences in active aging between men and women increase when ones analyzes the indicators according to age brackets. Men 80 years

and older, when compared to those 60 to 69 years of age, only decreased their participation in physical activity at work and in paid work. Meanwhile, women 80 years and older showed lower participation in sociocultural activities, in all domains of physical activity, and in work market participation when compared to younger elderly women. These findings highlight the need for strategies to promote active aging that are adapted and appropriate for men and women in different age groups in order avoid the persistence and aggravation of gender inequalities.

Contributors

N. F. S. Sousa participated in the study conception, data analysis and interpretation, and writing of the manuscript. M. G. Lima participated in the data analysis and interpretation and critical revision of the manuscript. C. L. G. Cesar participated in the critical revision of the manuscript. M. B. A. Barros participated in the study conception, data analysis and interpretation, critical revision of the manuscript, and approval of the final version for publication. All authors have approved the final version for publication of the article.

Acknowledgments

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Resumo

O objetivo deste estudo foi analisar as prevalências e as diferenças de gênero e idade em indicadores de envelhecimento ativo entre idosos participantes do Inquérito de Saúde do Município de Campinas, *São Paulo, Brasil, 2014-2015. Estimaram-se as prevalências de participação dos idosos em doze atividades relativas a quatro dimensões, e as razões de prevalência foram calculadas pela regressão de Poisson. A população de estudo foi composta por 986 idosos. Os resultados revelaram que 40,2% dos idosos participavam de atividades socioculturais, 25,3% eram fisicamente ativos no lazer, 21,7% usavam a Internet, 22,1% exerciam trabalho remunerado e apenas 2,6% realizavam cursos. Quanto à dimensão social, só houve diferença entre os sexos na frequência aos cultos religiosos, sendo menos prevalente entre os homens (RP = 0,67). Na dimensão da atividade física, os homens eram mais ativos no trabalho (RP = 2,10), no deslocamento (RP = 1,61) e no lazer (RP = 1,44). Na dimensão intelectual, não houve diferença entre os sexos e, em relação ao trabalho remunerado, os homens eram mais ativos (RP = 1,78). As análises segundo faixas etárias evidenciaram que, entre os homens, apenas a prática de atividade física no trabalho e o exercício de trabalho remunerado apresentaram menor prevalência no grupo de 80 anos e mais. Entre as mulheres mais longevas, foram identificadas menores prevalências em seis atividades, o que sinaliza possível efeito diverso do avanço da idade entre os sexos. Os resultados revelam expressiva participação dos idosos em alguns dos indicadores do envelhecimento ativo e os desafios no que concerne às atividades pouco realizadas e às diferenças de participação entre os sexos.*

Envelhecimento; Disparidades nos Níveis de Saúde; Gênero e Saúde; Idoso

Resumen

El objetivo de este estudio fue analizar las tasas de prevalencia y las diferencias de género y edad en los indicadores de envejecimiento activo en adultos mayores que participan en la Encuesta de Salud del Municipio de Campinas, *estado de São Paulo, Brasil (2014-2015). Estimamos las tasas de prevalencia para la participación de los ancianos en doce actividades relacionadas con cuatro dimensiones y calculamos las tasas de prevalencia con la regresión de Poisson. La población de estudio consistió en 986 ancianos. Los resultados mostraron que el 40,2% de los adultos mayores participaban en actividades socioculturales, el 25,3% era físicamente activo en su tiempo libre, el 21,7% utilizaba Internet, el 22,1% realizaba trabajo remunerado y solo el 2,6% asistía a cursos. En la dimensión social, la única diferencia de género estaba en la práctica religiosa, que era menos frecuente en los hombres (RP = 0,67). En la dimensión de la actividad física, los hombres eran más activos en el trabajo (PR = 2,10), en los desplazamientos diarios (PR = 1,61) y en su tiempo libre (PR = 1,44). No hubo diferencia de género en la dimensión intelectual, y los hombres eran más activos en el trabajo remunerado, (PR = 1,78). Los análisis por grupos de edad mostraron que en los hombres, solo la actividad física en el trabajo y el trabajo remunerado presentaron una prevalencia más baja en el grupo de 80 años y más. Entre las mujeres ancianas de mayor edad, se observaron tasas de prevalencia más bajas en seis actividades, lo que sugiere un posible efecto diferencial de la edad avanzada entre los sexos. Los resultados muestran tasas importantes de participación de personas mayores en algunos indicadores de envejecimiento activo, además de desafíos en actividades que se realizan con poca frecuencia y diferencias de género en la participación.*

Envejecimiento; Disparidades en el Estado de Salud; Género y Salud; Anciano

Sousa NFS, Lima MG, Cesar CLG, Barros MBA. Active aging: prevalence and gender and age differences in a population-based study. Cad Saúde Pública 2018; 34(11):e00173317.

The journal has been informed about some errors in the paper. The corrections are follows:

Where it reads:

Table 2

Prevalence and prevalence ratios (PR) of indicators of active aging according to gender. Campinas, São Paulo State, Brazil, 2014-2015.

Indicators	Total	Sex (%) Women (n = 599)	Men (n = 387)	p-value *	Adjusted PR **,***	95%CI	Adjusted PR **,#	95%CI
Social								
Family circle	89.0	89.0	88.4	0.647	0.98	0.94-1.04	0.98	0.93-1.03
Sociocultural activities	40.2	40.2	41.8	0.412	1.05	0.88-1.24	0.98	0.82-1.17
Volunteering/Associations	23.3	23.3	22.1	0.523	0.89	0.67-1.19	0.80	0.59-1.10
Religion	47.1	47.1	38.2	**< 0.001**	**0.70**	**0.60-0.82**	**0.67**	**0.57-0.78**
Physical activity								
Work	9.9	9.9	14.3	**< 0.001**	**1.97**	**1.41-2.77**	**2.10**	**1.45-3.03**
Commuting	10.9	10.9	12.5	0.1906	1.27	0.84-1.91	1.61	1.02-2.52
Household	11.4	11.4	11.4	0.9624	0.98	0.68-1.43	1.03	0.74-1.44
Leisure	25.3	25.3	32.1	**< 0.001**	**1.52**	**1.18-1.97**	**1.44**	**1.09-1.90**
Intellectual								
Internet use	21.7	21.7	25.6	**0.022**	1.27	0.98-1.65	0.91	0.73-1.13
Courses	2.6	2.6	1.9	0.387	0.61	0.20-1.85	0.48	0.15-1.52
Work								
Paid work	22.1	22.1	29.6	**< 0.001**	**1.66**	**1.31-2.11**	**1.78**	**1.40-2.25**
Retired, still working	5.2	5.2	7.8	**< 0.001**	**2.25**	**1.37-3.67**	**2.79**	**1.81-4.30**

95%CI: 95% confidence interval.

* Chi-square test;

** Reference category: female gender;

*** Age-adjusted prevalence ratio;

Prevalence ratio adjusted for age, conjugal status, and years of schooling.

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Religion	47.1	53.6	38.2	**< 0.001**	**0.70**	**0.60-0.82**	**0.67**	**0.57-0.78**
Physical activity								
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Prevalence ratio adjusted for age, conjugal status, and years of schooling.