

Regional differences and correlates of leisure time physical activity in Brazil: results from the Brazilian National Health Survey-2013

Diferenças regionais e fatores associados à prática de atividade física no lazer no Brasil: resultados da Pesquisa Nacional de Saúde-2013

Grégore Iven Mielke^{I,III,III}, Deborah Carvalho Malta^{II,IV}, Gisele Balbino Araújo Rodrigues de Sá^{II}, Rodrigo Siqueira Reis^V, Pedro Curi Hallal^{I,III,VI}

ABSTRACT: *Objective:* To analyze the regional differences and factors associated with physical activity during the leisure time in the adult participants of the National Health Survey, 2013. *Methods:* This study was carried out with the data from the National Health Survey, conducted in 2013 with an approximate sample of 63,000 adults (18+ years). For each of the five regions of Brazil, the prevalence of physically active adults during the leisure time was calculated, and the participants were classified as active if they practiced at least 150 minutes per week of physical activity during leisure time. *Results:* The prevalence of individuals who were active during the leisure time varied from 21.9% in the south to 24.4% in the midwest. The men were 1.48 (95%CI 1.40-1.57) times more active than women, with the northern region showing the highest difference between the sexes. The prevalence of active individuals was 67% lower among those aged 75+ years when compared with the 18-24 age group, and this difference was more marked in the north. Those with higher levels of education were on average three times more active than the participants with lower education levels. In terms of education level, the lowest difference was observed in the northeast. *Conclusion:* Despite the slight variations in the prevalence of physical activity during the leisure time among the regions, when population subgroups are considered, important differences were observed. These results suggest the need for promotion initiatives on physical activity with different approaches in each of the five regions of Brazil.

Keywords: Motor activity. Health promotion. Health surveys. Chronic diseases. Sports. Leisure activities. Health services accessibility.

^IGraduate Program in Epidemiology, *Universidade Federal de Pelotas* – Pelotas (RS), Brazil.

^{II}Department of Health Surveillance – Brasília (DF), Brazil.

^{III}Physical Activity Epidemiology Study Group, *Universidade Federal de Pelotas* – Pelotas (RS), Brazil.

^{IV}*Universidade Federal de Minas Gerais* – Belo Horizonte (MG), Brazil.

^VGraduate Program in Urban Management, *Pontifícia Universidade Católica do Paraná* – Curitiba (PR), Brazil.

^{VI}Graduate Program in Physical Education, *Universidade Federal de Pelotas* – Pelotas (RS), Brazil.

Corresponding author: Grégore I Mielke. Programa de Pós-Graduação em Epidemiologia, Universidade Federal de Pelotas. Rua Marechal Deodoro, 1160, 3º piso. CEP: 96020-220. Pelotas (RS), Brasil. E-mail: gregore.mielke@gmail.com

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RESUMO: *Objetivo:* Analisar as diferenças regionais e os fatores associados à prática de atividade física no lazer em adultos participantes da Pesquisa Nacional de Saúde, de 2013. *Métodos:* Este estudo foi realizado com os dados da Pesquisa Nacional de Saúde, realizada em 2013 com uma amostra aproximada de 63.000 adultos (18+ anos). Para cada uma das cinco regiões do Brasil foi calculada a prevalência de adultos ativos no lazer, sendo classificados como ativos aqueles participantes que praticaram pelo menos 150 minutos por semana de atividades físicas no lazer. *Resultados:* A prevalência de ativos no lazer variou de 21,9% no Sul a 24,4% no Centro-Oeste. Homens foram 1,48 (IC95% 1,40 – 1,57) vezes mais ativos que as mulheres, sendo a região Norte aquela que apresentou maior diferença entre sexos. A prevalência de ativos foi 67% menor entre aqueles com 75+ anos quando comparado ao grupo de 18-24 anos, sendo que esta diferença foi mais acentuada na região Norte. Aqueles com maior grau de instrução foram, em média, três vezes mais ativos que os participantes com menor grau de instrução. Em termos de grau de instrução, a menor diferença observada ocorreu no Nordeste. *Conclusões:* Apesar das pequenas variações na prevalência de prática de atividade física no lazer entre as regiões, quando são considerados subgrupos populacionais, diferenças importantes são observadas. Estes resultados sugerem a necessidade de ações de promoção de atividade física com diferentes abordagens em cada uma das cinco regiões do Brasil.

Palavras-chave: Atividade física. Promoção da saúde. Inquéritos epidemiológicos. Doenças crônicas. Esportes. Atividades de lazer. Acesso aos serviços de saúde.

INTRODUCTION

Owing to circulatory diseases being the leading cause of death in Brazil^{1,2}, the promotion of physical activity has integrated the agenda for the fight against chronic noncommunicable diseases adopted by the country in recent years^{3,4}. Thus, from the perspective of health management, knowing the existing physical activity standard and the population groups most at risk for this condition is very important. Several studies have investigated the demographic, environmental, and behavioral determinants and correlates of physical activity in different geographical locations and regions. In general, these studies have shown that men, young adults, and those with higher education levels are the population groups with the highest prevalence of physical activity during leisure time^{5,6}.

Research on physical activity in Brazil, especially on correlates and description of prevalence, is vast⁷⁻⁹. However, despite the large number of studies, there are still gaps in this area, especially in relation to the north and midwest regions⁷. With the completion of the National Health Survey (PNS), it became possible to compare the physical activity patterns across regions and, therefore, understand any differences between the population groups. In addition, the evaluation of these differences is essential to guide and support the development of promotion policies and programs for physical activity in the three levels of management, in order to meet the needs and specificities of the population in different regions.

Thus, this study aimed to analyze the regional differences and the factors associated with physical activity in leisure time among the adult participants of the 2013 National Health Survey.

METHODS

To conduct this study, we used information collected from the National Health Survey (PNS), which was designed and conducted by means of a partnership between the Ministry of Health and the Brazilian Institute of Geography and Statistics (IBGE). This is a home-based survey and is part of IBGE's Integrated Household Survey System, being the baseline for monitoring of noncommunicable diseases and disorders and its risk factors in Brazil.

Methodological, operational, and logistical details of PNS can be obtained on the official survey report¹⁰. Briefly, the sampling process conducted in the PNS targeted adults aged 18 years or older, living in private households in Brazil, with the exception of adults living in barracks, military bases, lodges, camps, boats, prisons, penal colonies, nursing homes, orphanages, convents, and hospitals, as its population. The sample selection was done in three stages, with census tracts, households, and residents aged 18 years or older as primary, secondary, and tertiary units, respectively. For each selected household, one adult aged 18 years or older was interviewed and selected equiprobabilistically among all adults living in the household. The selected adults answered three questionnaires, one containing information on the household, another with information on the health status of the other residents, and a questionnaire on lifestyle and health status, in which issues related to physical activity, were incorporated.

To measure the physical activity during leisure time, the following questions were used:

1. "In the last three months, did you practice some form of physical exercise or sport?";
2. "What is the main type of exercise or sport that you practiced?";
3. "Do you practice the exercise at least once a week?";
4. "How many days per week do you practice physical exercise or a sport?" and
5. "On the day that you practice the exercise or sport, how long does this activity last?"

A weekly score of physical activity, in which the time spent in activities was multiplied by the number of days, was built. For the participants who reported having practiced running, aerobics/spinning/step/jump, football, basketball, or tennis, the reported time was multiplied by two, because these physical activities are considered vigorous. This strategy aims to incorporate the suggestions of the practice of physical activity for at least 150 minutes per week of moderate activity or 75 minutes per week of vigorous activities. The participants who reported performing at least 150 minutes per week of physical activity during the leisure time were classified as active during leisure time.

Initially, for each of the five major regions, the prevalence of participants who were active during leisure time was calculated according to sex (male and female), age groups (18 – 24; 25 – 34; 35 – 44; 45 – 54; 55 – 64; 65 – 74; and 75+ years), and education level; it was classified as

- Grade I – uneducated and incomplete primary education;
- Grade II – complete primary and incomplete secondary education;
- Grade III – complete secondary and incomplete superior education;
- Grade IV – complete superior education.

To compare the degree of difference between the practice of physical activity during leisure time between age groups and education levels, we used the *equiplot* graphical method, developed by the International Center for Equity in Health (www.equidade.org). Second, the crude and adjusted prevalence ratios were calculated, and the respective 95% confidence intervals (95%CI) were measured for each of the independent variables. For this, Poisson regression analyzes were conducted. Analyses were performed using Stata, version 12.1. In all analyzes, we used the *svy* command in order to consider the sample weights and expand the results for the Brazilian population. All interviewees were consulted, informed, and agreed to participate by signing an informed consent form. The PNS was approved by the National Ethics Committee, under protocol number 328.159 in June 26, 2013.

RESULTS

A total of 81,167 households were eligible to participate in the PNS, distributed in all major regions of Brazil. From the selected universe, 60,202 adults aged 18 years or older were interviewed, with valid data on physical activity obtained for 59,667 participants. The interviewed sample consisted of 52% women. The proportion of participants aged 75 years or older was around 5%, varying 2.7% in the northern region to 5.2% in the southeastern region. Just over 12% of the sample exhibited Grade IV instruction (complete superior education), with 8.3% in the northeast and 15.5% in the southeast regions.

Table 1 shows the prevalence of individuals who are active during leisure time according to sex, age groups, and the level of education for Brazil and each of the five major regions. In all the regions, the prevalence of physical activity during leisure time was higher among men, younger people, and those with higher levels of education. Around 27% of men were classified as active during leisure time, with little variation in this prevalence among the five major regions.

The southeast region was the one with the highest prevalence of physical activity during leisure time among participants aged between 18 and 24 years (38.1%). Among those aged 75 years or older, the prevalence of physical activity during leisure time varied showing 2.2% in the north and 12.4% in the midwest regions. The midwest region was also the one with the highest prevalence of physical activity during leisure time among respondents with higher educational level. It was observed that the degree of difference in the practice of physical activity between the age groups was higher in the northern region and the southern region being the

one with the smallest difference. Finally, the practice of physical activity during leisure time according to the educational level did not show a large regional variation (Figure 1).

The analyses of crude and adjusted association between physical activity during leisure time and sociodemographic variables are presented in Tables 2 and 3, respectively. In general, the prevalence of physical activity among men was around 50% higher when compared with women, except for the northern region, where men were almost twice as active as women. By considering the whole sample, the southeast, south, and midwest regions showed less difference in practice between the age groups. Regarding the educational level, the adjusted analysis showed, from the whole sample, the participants with higher levels of education (Grade IV) were 3.03 (95%CI 2.78 – 3.29) times more active during leisure time when compared with those with less education (Grade I). The northeast region showed the smallest relative difference in the practice of physical activity between participants with high and low levels of education.

Table 1. Description of the practice of physical activity during leisure time according to sociodemographic variables in Brazil and major regions. National Health Survey, 2013.

Variables	Brazil %	North %	Northeast %	Southeast %	South %	Midwest %
Sex						
Female	18.5	15.5	17.7	19.2	18.3	20.4
Male	27.4	29.8	27.8	27.1	25.8	28.9
Age						
18 – 24	35.9	36.8	34.9	38.1	30.7	36.5
25 – 34	27.4	26.7	28.6	26.4	27.8	28.2
35 – 44	21.0	20.2	20.4	20.9	21.6	23.1
45 – 54	18.0	15.7	16.0	19.5	17.1	19.2
55 – 64	17.6	10.4	16.2	18.9	17.1	20.1
65 – 74	15.3	9.6	15.3	15.7	16.5	15.2
75+	8.0	2.2	5.3	8.8	10.0	12.4
Educational level (grade)						
I	11.8	11.3	13.0	11.0	11.1	12.1
II	23.9	25.3	29.1	21.1	23.2	23.2
III	29.2	31.5	30.8	28.2	27.7	30.4
IV	38.3	36.1	36.4	38.9	36.4	43.3
Total	22.7	22.4	22.5	22.9	21.9	24.4

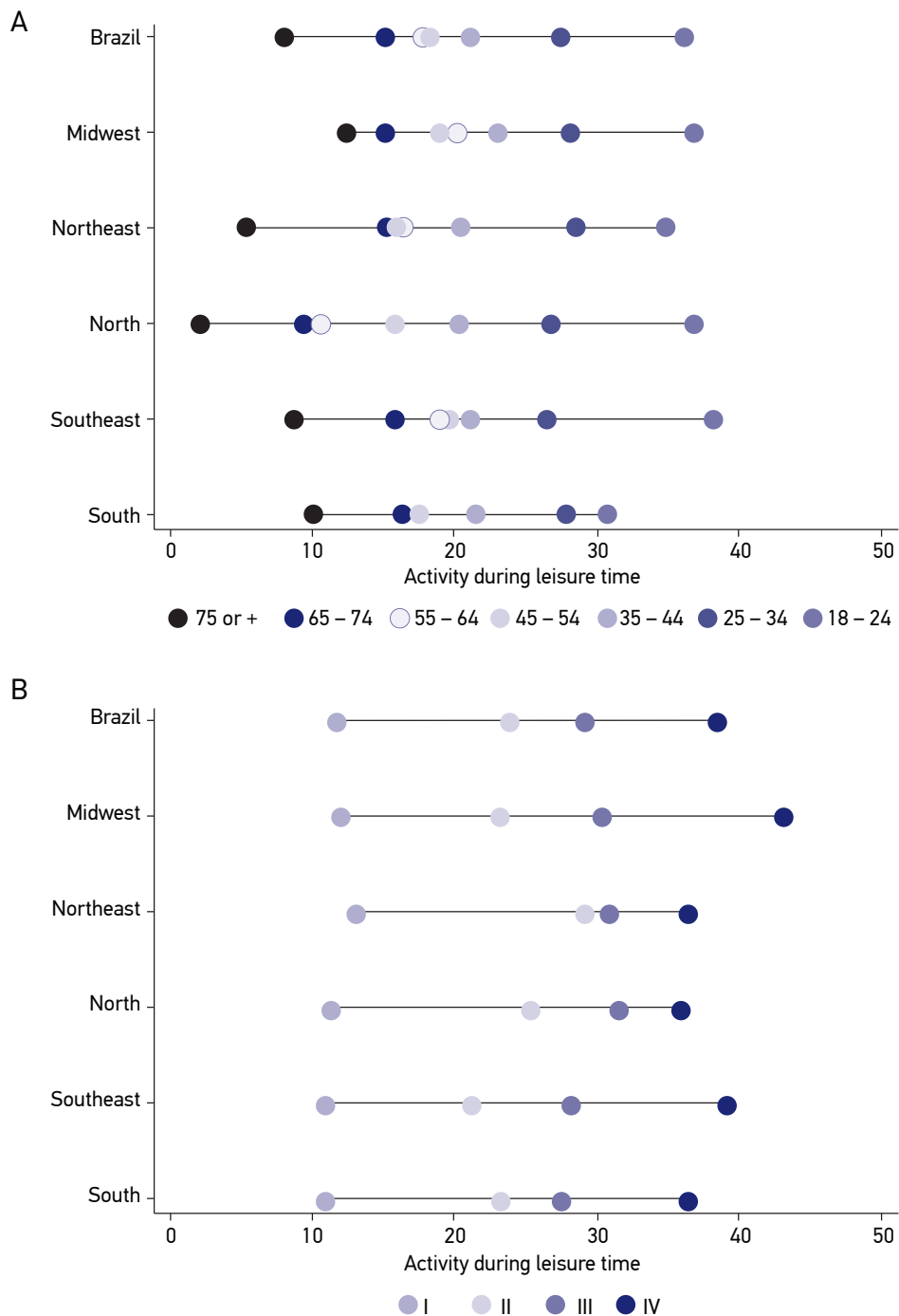


Figure 1. Differences in the practice of physical activity during leisure time in Brazil according to (A) age groups; (B) educational level. National Health Survey, 2013.

Table 2. Crude association between the practice of physical activity during leisure time and sociodemographic variables in Brazil and major regions. National Health Survey, 2013.

	Brazil	North	Northeast	Southeast	South	Midwest
	PR (95%CI)	PR (95%CI)	PR (95%CI)	PR (95%CI)	PR (95%CI)	PR (95%CI)
Sex						
Female	1.00	1.00	1.00	1.00	1.00	1.00
Male	1.48 (1.40 – 1.57)	1.92 (1.69 – 2.18)	1.57 (1.43 – 1.72)	1.41 (1.28 – 1.55)	1.41 (1.24 – 1.61)	1.42 (1.27 – 1.57)
Age						
18 – 24	1.00	1.00	1.00	1.00	1.00	1.00
25 – 34	0.76 (0.71 – 0.82)	0.72 (0.62 – 0.84)	0.82 (0.73 – 0.93)	0.69 (0.60 – 0.80)	0.91 (0.75 – 1.01)	0.77 (0.67 – 0.90)
35 – 44	0.58 (0.54 – 0.63)	0.55 (0.46 – 0.65)	0.59 (0.51 – 0.67)	0.55 (0.47 – 0.64)	0.70 (0.57 – 0.86)	0.63 (0.54 – 0.74)
45 – 54	0.50 (0.46 – 0.55)	0.43 (0.34 – 0.54)	0.46 (0.40 – 0.53)	0.51 (0.44 – 0.60)	0.56 (0.44 – 0.70)	0.53 (0.44 – 0.62)
55 – 64	0.49 (0.44 – 0.55)	0.28 (0.21 – 0.38)	0.46 (0.38 – 0.56)	0.50 (0.42 – 0.59)	0.56 (0.43 – 0.72)	0.55 (0.46 – 0.67)
65 – 74	0.43 (0.38 – 0.49)	0.26 (0.16 – 0.42)	0.44 (0.35 – 0.56)	0.41 (0.33 – 0.51)	0.54 (0.40 – 0.72)	0.42 (0.32 – 0.54)
75+	0.22 (0.18 – 0.27)	0.06 (0.03 – 0.15)	0.15 (0.10 – 0.22)	0.23 (0.17 – 0.31)	0.32 (0.20 – 0.53)	0.34 (0.19 – 0.61)
Educational level (grade)						
I	1.00	1.00	1.00	1.00	1.00	1.00
II	2.03 (1.85 – 2.23)	2.23 (1.82 – 2.73)	2.23 (1.94 – 2.57)	1.92 (1.59 – 2.33)	2.09 (1.68 – 2.60)	1.91 (1.58 – 2.32)
III	2.48 (2.30 – 2.67)	2.79 (2.36 – 3.29)	2.36 (2.11 – 2.64)	2.57 (2.21 – 3.00)	2.50 (2.08 – 3.01)	2.50 (2.14 – 2.93)
IV	3.25 (2.99 – 3.53)	3.19 (2.61 – 3.91)	2.79 (2.44 – 3.18)	3.54 (3.02 – 4.16)	3.28 (2.70 – 3.99)	3.57 (3.05 – 4.18)

PR: prevalence ratio; 95%CI: 95% confidence intervals.

Table 3. Adjusted association* between the practice of physical activity during leisure time and sociodemographic variables in Brazil and major regions. National Health Survey, 2013.

	Brazil	North	Northeast	Southeast	South	Midwest
	PR (95%CI)	PR (95%CI)	PR (95%CI)	PR (95%CI)	PR (95%CI)	PR (95%CI)
Sex						
Female	1.00	1.00	1.00	1.00	1.00	1.00
Male	1.52 (1.44 – 1.60)	2.02 (1.79 – 2.28)	1.63 (1.49 – 1.79)	1.43 (1.30 – 1.57)	1.42 (1.25 – 1.61)	1.48 (1.34 – 1.64)
Age						
18 – 24	1.00	1.00	1.00	1.00	1.00	1.00
25 – 34	0.72 (0.67 – 0.78)	0.71 (0.62 – 0.82)	0.80 (0.71 – 0.90)	0.65 (0.57 – 0.75)	0.80 (0.67 – 0.97)	0.72 (0.62 – 0.83)
35 – 44	0.59 (0.55 – 0.64)	0.56 (0.47 – 0.66)	0.61 (0.54 – 0.70)	0.56 (0.48 – 0.65)	0.69 (0.57 – 0.85)	0.63 (0.54 – 0.74)
45 – 54	0.55 (0.51 – 0.60)	0.48 (0.38 – 0.59)	0.52 (0.45 – 0.60)	0.56 (0.48 – 0.65)	0.62 (0.49 – 0.77)	0.60 (0.51 – 0.70)
55 – 64	0.58 (0.52 – 0.64)	0.34 (0.25 – 0.47)	0.57 (0.47 – 0.69)	0.58 (0.49 – 0.69)	0.66 (0.51 – 0.84)	0.68 (0.57 – 0.81)
65 – 74	0.58 (0.51 – 0.65)	0.34 (0.22 – 0.52)	0.60 (0.47 – 0.75)	0.55 (0.45 – 0.68)	0.73 (0.56 – 0.97)	0.62 (0.48 – 0.79)
75+	0.33 (0.27 – 0.40)	0.10 (0.04 – 0.23)	0.22 (0.15 – 0.32)	0.35 (0.26 – 0.48)	0.47 (0.29 – 0.78)	0.54 (0.30 – 0.96)
Educational level (grade)						
I	1.00	1.00	1.00	1.00	1.00	1.00
II	1.69 (1.54 – 1.86)	1.68 (1.38 – 2.05)	1.81 (1.57 – 2.10)	1.61 (1.32 – 1.95)	1.82 (1.45 – 2.30)	1.70 (1.40 – 2.06)
III	2.06 (1.90 – 2.23)	2.17 (1.82 – 2.58)	1.99 (1.77 – 2.24)	2.10 (1.78 – 2.48)	2.18 (1.78 – 2.67)	2.21 (1.88 – 2.59)
IV	3.03 (2.78 – 3.29)	3.03 (2.45 – 3.73)	2.70 (2.37 – 3.08)	3.23 (2.75 – 3.80)	3.04 (2.47 – 3.73)	3.36 (2.87 – 3.94)

*Adjusted for sex, age and educational level. PR: prevalence ratio; 95%CI: 95% confidence intervals.

DISCUSSION

The results of this study showed that, approximately, one in five Brazilian adults practiced physical activity during leisure time, in accordance with the international recommendations, with a low variation of this practice among the five major regions of Brazil. As expected, men, younger people, and those with higher levels of education were more active during leisure time, regardless of the region analyzed. However, significant variations were observed in relation to sex, age, and level of education among the regions of Brazil.

It is not surprising in the scientific literature that younger individuals with higher educational levels are those with the highest prevalence of physical activity when compared with their peers, including in Brazil^{5,6}. The differences found in terms of age can be explained by factors ranging from biological questions to social and environmental aspects. The limitations imposed by age and the burden of disease may be one of the factors that explain the lower prevalence of physical activity during leisure time among these groups. Moreover, older individuals are less likely to perceive regular physical activity as an important factor for health, compared with younger people^{11,12}. It should be noted that environmental aspects can also interact with age in relation to physical activity during leisure time. For example, Rech et al.¹³, analyzing the social and environmental correlates of physical activity in adults living in Curitiba, showed that the greatest security against crimes was a predictor of practice of physical activity only among the older participants¹³. Thus, the same degree of environmental exposure related to security can negatively influence the physical activity in older individuals. However, it may not interfere with the younger, confirming the differences in levels of physical activity during leisure time between the age groups.

In this study, it was observed that the north and northeast regions showed the largest differences in physical activity during leisure time between the age groups, while the south region was the one that showed the lowest difference. We can analyze these results in view of the wide disparity in life expectancy between the regions. By considering the results of the National Health Survey, we observed that the percentage of participants aged 75 years or older was twice as high in the south and southeast regions, when compared with the north. Thus, the differences may be owing to the age difference, with a larger presence of young people in the northern region, but a higher degree of disability owing to older age in the region should also be considered.

Despite the advances and the fight against socioeconomic inequalities, which have been occurring in the recent decades, Brazil still shows large inequality¹⁴, which is a major challenge for the management of the health sector and other sectors. Regarding the practice of physical activity during leisure time, inequalities have been strongly related to aspects that increase the chance of individuals to practice more or less physical activity, mainly owing to issues related to opportunities of access to appropriate spaces for the practice, which, in Brazil, are mostly still private spaces. For example, Reichert et al.¹⁵, analyzing the barriers to the practice of physical activity among adults

living in a city in southern Brazil, showed that lack of money was twice more reported as a barrier to physical activity among the participants with a lower socioeconomic classification when compared with their peers. On the other hand, in the same study, the authors found that not liking to practice physical activity was reported in a similar proportion among the richest and poorest.

The discussion on socioeconomic inequalities in physical activity can occur under different contexts. From the perspective of preventing and fighting chronic diseases, lower levels of physical activity may be one of the factors associated with higher rates of premature cardiovascular death, being more frequent among individuals living with a low socioeconomic status. A study conducted by Nogueira et al.¹⁶ showed that residents of the city of Juiz de Fora (MG) who lived in areas with better socioeconomic conditions showed significantly lower premature cardiovascular mortality rates than their peers. Studies in other countries have found similar results^{17,18}.

Given the importance of physical activity in coping with chronic noncommunicable diseases in recent years, Brazil has advanced in the incentive to health promotion and physical activity promotion initiatives¹⁸. Local initiatives such as the Academia da Cidade Program in Recife (PE) and Aracaju (SE) have been successful in allowing the population greater access to spaces for the practice of physical activity. Assessment of these programs have shown that user's profile is the women, the elderly, and the less educated, precisely the groups with the lowest prevalence of physical activity during leisure time^{19,20}. Moreover, exposure to the Academia da Cidade program in Recife was associated with larger rates of practice of physical activity²¹. Still, individuals using public spaces with the program were more active when compared with individuals using similar spaces but without the program²². In addition to local initiatives, it is worth highlighting the creation of the Academia da Saude program by the Ministry of Health in 2011, with a funding forecast of up to 4,000 poles for the development of community interventions to promote health, including the promotion of physical activity free of charge, as a way to facilitate population access to appropriate spaces for physical activity²³.

Despite the development of actions and policies to promote physical activity, there are still regional disparities which, in part, may explain the differences found in our study. For example, in order to increase access to physical activity options during leisure time, between 2005 and 2009, the Ministry of Health has financially supported more than 1,000 municipalities for the development of physical activity promotion programs, and the midwest region showed the larger proportion of cities supported. However, most municipalities financed were small, resulting in low population coverage²⁴. In this study, it was observed that the northern region showed the lowest proportion of financed municipalities, showing that the environmental and political characters of actions and difficulties in physical infrastructure and professional training constitute important points of reflection, so that the effectiveness of physical activity programs is leveraged²⁴. Ramos et al.²⁵, when conducting a telephone survey with a representative sample of primary care units in Brazil to determine the prevalence of health promotion programs, found that 40% of primary

health care units carry out activities within the framework of physical activity. However, this prevalence varied significantly between the regions of Brazil, with 50.9% in the southeast region to 21.3% in the north²⁵.

Some limitations should be discussed. The socioeconomic indicator used for these analyzes was the level of education. We believe that the construct of socioeconomic conditions can be more complex than simply the level of education. However, we believe that this variable can be a great indicator of socioeconomic conditions, both individually and contextually. Although physical activity can occur in different domains such as work, housework, and during the trip to work/back home, we decided to restrict our analysis only to the leisure time, as we believe that this area has a great potential for intervention.

CONCLUSION

This was the first study investigating the practice of physical activity during leisure time, focusing on the analysis of the degree of difference between population subgroups and regions of Brazil. This type of research is only made possible owing to the robustness of the data collected and standardization of the instrument applied to all regions of Brazil, a fact that allows us to make comparisons in absolute and relative terms.

Finally, although there is little difference in the prevalence of physical activity during leisure time among regions, this study showed that there are important differences in physical activity during leisure time among the five major regions when population subgroups are analyzed, highlighting the low prevalence of physical activity during leisure time among the older population living in the northern region. These results suggest the need for physical activity promotion initiatives with different approaches in each of the five regions of Brazil.

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