Gender differences in leisure-time physical activity

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Summary

Objectives: To explore the association between gender and leisure-time physical activity in a population-based sample of adults living in Brazil. To study a variety of variables possibly associated with physical activity levels.

Methods: A multistage sampling of households was undertaken in Pelotas, a medium-sized Southern Brazilian city. Leisure-time physical activity was measured using the long version of the International Physical Activity Questionnaire. Data on potential predictors of leisure-time physical activity behavior were collected using a standardized questionnaire. 1344 men and 1756 women were interviewed. Several definitions of moderate and vigorous-intensity physical activity were used.

Results: Regardless of the guideline used, males were more active than women. Socioeconomic level was positively associated with leisure-time physical activity in both genders. A positive dose-response between age and inactivity was found in men, but not among women.

Conclusions: Because men and women have different levels of physical activity, and the variables associated with activity levels are not consistent across the genders, interventions promoting physical activity should take these differences into account.

Keywords: Exercise – Sedentarism – Correlates – Determinants – Associated factors – Epidemiology – Developing countries.

The association between physical activity and health is well-known; active individuals present a lower likelihood of developing several chronic diseases, and exercise is also recommended in the treatment of some diseases (World Health Organization 2004; U.S Department of Health and Human Services 1996). However, alarming rates of sedentarism are observed both in developed (Varo et al. 2003) and developing countries (Monteiro et al. 2003), in spite of several current initiatives aimed at increasing population activity level (U.S. Department of Health and Human Services 2000; Ministério da Saúde 2002). Recently, Bucksch & Schlicht (2006) reviewed the literature on how much physical activity is enough to prevent detrimental health effects. It was concluded that sedentary men and women can decrease the risk of a whole spectrum of diseases by following current guidelines of 30 minutes of moderate-intensity activities per day on most days of the week (Bucksch & Schlicht 2006).

Previous studies suggested that males are more active than females in leisure-time, although not all were consistent (Monteiro et al. 2003; Burton & Turrell 2000; Gomes et al. 2001; Martinez-Gonzalez et al. 2001; Steptoe et al. 2002). More recent data showed that, when all domains of activity practice are considered, no gender differences are observed (Hallal et al. 2003). Few studies, however, have explored the variables associated with physical inactivity among men and women separately, and most of these were carried out in high-income countries, where activity patterns are different from those observed within low and middle-income ones.

The aim of this study was to explore leisure-time physical activity patterns and associated variables among men and women separately in a population-based sample of adults living in Brazil.

Materials and methods

A cross-sectional health investigation was carried out in Pelotas, a medium-sized (320,000 inhabitants) Southern Brazilian city, in the last trimester of 2003. The sample was se-
lected in multiple-stages. All urban census tracts (N = 404) of Pelotas were stratified by the average income of family heads. Thereafter, 144 were sampled with probability proportionate to the size. Within each selected tract, households were sampled following a systematic protocol, and taking the size of the tract (number of households) into account. All residents of each sampled household were interviewed. These analyses were restricted to individuals aged 20 years or more. The actual sample size interviewed (N = 3100) enabled us to detect significant differences between males and females in the proportion of compliance with physical activity recommendations as small as two percentage points.

Leisure-time physical activity was assessed using the section four (recreation, sports and leisure-time) of the long version of the International Physical Activity Questionnaire (IPAQ) (Craig et al. 2003). The IPAQ computes only activities performed for at least 10 consecutive minutes. Walking, moderate- and vigorous-intensity activities are assessed; definition of the intensity of each activity is based on the degree of physical effort required, taking changes in respiration rate into account. A physical activity score was constructed as the weekly time spent in moderate-intensity (including walking) plus twice the weekly time spent in vigorous-intensity activities, as suggested previously (Hallal et al. 2003). The score was divided into four groups for some specific analyses: 0 minutes/week: physically inactive; 1–149 minutes/week: some degree of activity, but insufficiently active to obtain health benefits; 150–499 minutes/week: sufficiently active; ≥500 minutes/week: highly active. This categorization was used in previous publications (Hallal et al. 2005). Validity of the IPAQ was tested in Brazil in several studies (Pardini et al. 2001; Barros & Nahas 2000; Hallal et al. 2004). Overall, results of these studies indicate the IPAQ is a reliable tool for measuring physical activity in this setting.

The independent variables included were age, economic level (Classification of the National Agency of Research Institutes, which considers both household assets and education of the family head, and where “A” is the wealthiest group), schooling (years of education), smoking status, and self-reported health status. Among individuals who performed at least 10 minutes of physical activity in the seven days prior to the interview, the main reason for being engaged in physical activity was also investigated. The question used for this purpose was: “Which of the following reasons is the most important in order to make you practice physical activity?” The options were: (a) medical advice; (b) enjoyment; (c) belief that physical activity is important for health; and (d) other reasons (opened-ended alternative).

Women with at least secondary education collected data in face-to-face interviews. They were trained for 40 hours in the application and codification of the questionnaire, and were blinded to the aims of the study. Individuals were only classified as non-respondents when they were not interviewed after at least three contacts of the interviewer (different days and hours) and one of a field supervisor. The significance level used was 5%. All analyses took the clustering of the sample into account. Differences between categorical variables were calculated using the chi-square tests for heterogeneity and trend. Differences between means were calculated using the t-test and analysis of variance. Logistic Multinomial regression models were used for adjusted analyses. The Federal University of Pelotas Medical School Ethical Committee approved the research protocol, and informed consents were obtained from each subject.

Results

Within the 1530 sampled households, 1407 men and 1807 women eligible for the study were found, of whom 1344 men and 1756 women were actually interviewed. Thus, non-response was 4.5% among men and 2.8% among women. Table 1 describes the sample in terms of socio-demographic variables, smoking status and self-reported health status stratified by gender. Females were on average older than males. Schooling and socioeconomic level distributions were similar among men and women. The prevalence of smoking was 35% higher in men than in women. Men tended to classify their health better than women.

Table 2 describes the sample in terms of several leisure-time physical activity indicators. Days of walking were similarly reported across the sexes, while the practice of moderate and vigorous-intensity physical activities was more frequent among men. The proportion of individuals with score zero was 29% higher in women than men, and the prevalence of high activity level (score ≥500) was two-fold higher among men than among women (10.8% and 5.4%, respectively). Treating this physical activity score as a continuous variable, the average ±SD among men was 189 ± 374, while among women it was 105 ± 246. The 5th, 25th, 50th, 75th and 95th percentiles among men were 0, 0, 15, 240 and 840, while among women the equivalent values were 0, 0, 0, 120 and 540. Both distributions were positively skewed (p < 0.001).

Figure 1 shows the percentage of compliance with several interpretations of current physical activity recommendations used in the literature among men and women separately. Men were more likely than women to achieve all criteria, with stronger relative differences for the vigorous activities guidelines (criteria 3 and 4).

Table 3 shows the variables associated with physical activity practice among men and women. Among males, individuals in the intermediate age groups were more likely to score
zero, while among females, older ones (≥70 years) were more likely to be sedentary. No dose-response associations were detected between physical activity score and age regardless of the gender. The Spearman correlation coefficient between the continuous physical activity score and age was −0.19 among men and −0.03 among women.

In terms of schooling level, males with ≥9 years of formal education presented 75% lower risk of scoring zero in comparison to those with low education (0–4 years). Among women, this difference was less extreme (35%). The Spearman correlation coefficient between the continuous physical activity score and years of formal education was 0.23 among males and 0.18 among females.

Economic level showed a clear dose-response positive association with the physical activity score among women. Those in the group “E” presented 110% increased prevalence of score zero in comparison with those from level “A”. Among men, groups “C”, “D” and “E” presented comparable prevalence of subjects scoring zero, approximately 60% higher than males from the “A” level.

In both sexes, never smokers presented a lower prevalence of no physical activity (score 0). However, the prevalence ratio for having no activity among current smokers in comparison with never smokers was different across the sexes (1.42 among males and 1.15 among females). The worse the self-reported health status, the lower the proportion of subjects with a physical activity score above the 150-minute threshold, both in men and women.

| VARIABLE                        | MEN (n = 1344)* | WOMEN (n = 1756)b | P value |
|---------------------------------|-----------------|-------------------|---------|
| Mean (SD) age in years          | 42.6 (15.5)     | 43.7 (16.6)       | 0.04⁴   |
| Age groups (years)              |                 |                   |         |
| 20–29                           | 25.5 % (342)    | 23.8 % (417)      | 0.22⁵   |
| 30–39                           | 20.8 % (279)    | 20.8 % (366)      |         |
| 40–49                           | 22.5 % (303)    | 21.5 % (377)      |         |
| 50–59                           | 15.9 % (213)    | 16.0 % (280)      |         |
| 60–69                           | 8.8 % (118)     | 8.9 % (157)       |         |
| ≥70                             | 6.6 % (89)      | 9.1 % (159)       |         |
| Mean (SD) schooling in years    | 7.6 (4.3)       | 7.8 (4.5)         | 0.17³   |
| Schooling groups (years)        |                 |                   |         |
| 0–4                             | 26.0 % (349)    | 26.3 % (462)      | 0.05⁵   |
| 5–8                             | 34.9 % (468)    | 31.0 % (545)      |         |
| 9–11                            | 25.9 % (348)    | 26.7 % (468)      |         |
| ≥12                             | 13.2 % (177)    | 16.0 % (281)      |         |
| Economic level                  |                 |                   | 0.39⁴   |
| A                               | 5.1 % (68)      | 4.6 % (81)        |         |
| B                               | 20.9 % (279)    | 19.8 % (347)      |         |
| C                               | 32.8 % (438)    | 33.1 % (579)      |         |
| D                               | 34.0 % (454)    | 36.5 % (639)      |         |
| E                               | 7.2 % (95)      | 5.9 % (103)       |         |
| Smoking status                  |                 |                   | <0.001⁴ |
| Never smokers                   | 41.4 % (556)    | 58.7 % (1031)     |         |
| Former smokers                  | 27.4 % (368)    | 18.2 % (319)      |         |
| Current smokers                 | 31.2 % (420)    | 23.1 % (406)      |         |
| Self-reported health status      |                 |                   | <0.001⁴ |
| Excellent                       | 15.8 % (213)    | 10.4 % (182)      |         |
| Very good                       | 17.6 % (236)    | 13.3 % (232)      |         |
| Good                            | 47.0 % (631)    | 46.0 % (803)      |         |
| Average                         | 17.0 % (229)    | 25.8 % (450)      |         |
| Poor                            | 2.6 % (35)      | 4.5 % (79)        |         |

* The maximum number of missing values was 9 (economic level)

b The maximum number of missing values was 10 (self-reported health status)

⁴ T-test ⁵ Chi-square test
Table 2 Description of the sample in terms of leisure-time physical activity variables stratified by gender

| VARIABLE                                | MEN (n = 1344)* | WOMEN (n = 1756) |
|-----------------------------------------|-----------------|-------------------|
| Days of walking in the previous week*    |                 |                   |
| 0                                       | 72.0 % (968)    | 70.9 % (1242)     |
| 1–2                                     | 9.0 % (121)     | 9.4 % (166)       |
| 3–4                                     | 6.9 % (92)      | 8.4 % (148)       |
| ≥5                                      | 12.1 % (162)    | 11.3 % (199)      |
| Days of moderate activities (other than walking) in the previous week** |                 |                   |
| 0                                       | 76.0 % (1020)   | 92.1 % (1616)     |
| 1–2                                     | 14.2 % (191)    | 3.9 % (69)        |
| 3–4                                     | 4.8 % (65)      | 2.1 % (37)        |
| ≥5                                      | 5.0 % (67)      | 1.9 % (34)        |
| Days of vigorous activities in the previous week** |                 |                   |
| 0                                       | 81.4 % (1094)   | 92.2 % (1619)     |
| 1–2                                     | 8.5 % (114)     | 2.9 % (50)        |
| 3–4                                     | 5.6 % (75)      | 3.2 % (57)        |
| ≥5                                      | 4.5 % (61)      | 1.7 % (29)        |
| Leisure-time physical activity score* **|                 |                   |
| 0                                       | 49.8 % (670)    | 64.4 % (1126)     |
| 1–149                                   | 17.1 % (229)    | 13.6 % (238)      |
| 150–499                                 | 22.3 % (298)    | 16.6 % (290)      |
| ≥500                                    | 10.8 % (144)    | 5.4 % (95)        |

* p = 0.25 (Chi-square test)

** p < 0.001 (Chi-square test)

* Minutes/week spent in moderate activities (including walking) + minutes/week of vigorous activities times two

All analyses presented in Table 3 were repeated using Multinomial Logistic Regression. The results were consistent with those observed in the crude analysis, and therefore, are not presented. Only one important exception was observed: the effect of smoking (former and current) on the proportion of individuals scoring zero among males was minimized from 1.98 and 2.13, respectively (crude analyses) to 1.46 and 1.54 (after adjusting for age, economic level and schooling).

Among all individuals who reported practicing at least 10 minutes of physical activity in the week prior to the inter-
view, the main reason for physical activity practice was investigated. Medical advice was the main reason for physical activity practice among 8.4% of the men and 18.5% of the women; enjoyment was reported by 47.9% of the men and 24.6% of the women studied. The answer “because physical activity is important for health” was given by 41.2% of all men and 52.9% of all women. Other reasons were reported by less than 5% in both sexes.

**Discussion**

In a population-based sample of Brazilian adults, leisure-time physical activity level in males and females was explored. Men presented higher activity levels than women in terms of moderate-intensity, vigorous-intensity and total leisure-time physical activity practice. Walking was the only group of activities similarly reported among males and females. Variables associated with physical activity practice were mostly similar across the sexes, although some important differences were observed. The reasons for physical activity practice were completely different among men and women, a finding that might help explain the different activity levels observed. Our results are in accordance with previous studies, from both developed and developing countries, which showed that men are more active than women in leisure-time (Monteiro et al. 2003; Burton & Turrell 2000; Gomes et al. 2001; Martinez-Gonzalez et al. 2001; Steptoe et al. 2002). However, when other domains of activity practice (housework, transporta-
is gender-dependent. Furthermore, whether this association is also observed when activities practiced in other settings than leisure-time are considered, is an unanswered question. Despite the fact that this was a cross-sectional investigation, and no causal inference shall be made between smoking status and physical activity level, we explored the cross-sectional association between these variables. Both men and women, who were currently smokers presented higher likelihood of being inactive, a finding that have been reported earlier (Burton & Turrell 2000; Martinez-Gonzalez 2001). Accumulation of non-healthy conditions is a probable explanation for this finding.

Our data showed marked differences between males and females on the prevalence of inactivity, regardless of the criteria used. In all of them, men were more likely to be considered active. In our view, a possible explanation for the gender difference in leisure-time practice is related to the reasons reported for being engaged in physical activity. In our study, enjoyment was the reason reported for almost half of men, against only 1/4 of women. On the other hand, “because a physician recommended me to practice physical activity” was cited for more women than men. These contrasting findings may have important implication in terms of public health and may be explained by many factors, such as cultural and social ones. Although the instrument we used to estimate leisure-time physical activity (IPAQ) does not gather data about which activities are performed, it has been shown that Brazilian men practice more activities in group (soccer, volleyball, and basketball) than women, who practice more individualized activities (swimming, walking, and jogging) (Monteiro et al. 2003). This pattern is also observed among Brazilian adolescents (da Silva & Malina 2000). In summary, these data indicate that while men practice physical activity because they enjoy it, women seem to practice it with the goal of either improvement of health or aesthete. Women also reported practicing physical activity because of a medical advice more frequently than men. The fact that women also visit a physician more regularly than men might explain this difference (Mendoza-Sassi & Beria 2003). Thereby, health professionals must be aware of their potential to mediate healthy behavior, not only among sick individuals, but also in the population as a whole.

Because only leisure-time activities were investigated, one should realize that subjects with no activity in our study may have some degree of physical activity in other domains, such as occupation, housework or transportation. Studies on leisure-time activities alone are valuable for understanding variables associated with intentional physical activity practice, because level of activity at work, for example, does not depend on the will of the subject alone.
In summary our data shall be used as a support by policy makers in order to plan interventions to increase the population level of leisure-time physical activity. Furthermore, interventions might focus on different aspects, depending on the gender targeted. At last, since inactivity is known to be mediated by an extended number of factors others than demographic (e.g. psychological, cognitive, behavioral attributes, social, environmental, and cultural) (Trost et al. 2002), a behavioral shift in the desired direction is dependent of an intervention tailoring all of these factors.

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Gender differences in leisure-time physical activity

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