Public Health Nutrition: 11(8), 841–848 doi:10.1017/S1368980007001309

Dietary intake and different types of physical activity: full-day energy expenditure, occupational and leisure-time

Miguel Camões* and Carla Lopes
Department of Hygiene and Epidemiology, University of Porto Medical School, Alameda Prof. Hernani Monteiro, 4200-319 Porto, Portugal

Submitted 21 December 2006: Accepted 16 September 2007: First published online 6 December 2007

Abstract

Objective: To describe the relationship between dietary intake and different levels and types of physical activity (PA).
Design: Cross-sectional evaluation of the EPIPorto study. Energy expenditure (metabolic energy equivalent tasks) and dietary intake during the past year were assessed using a PA questionnaire and a semi-quantitative food-frequency questionnaire, respectively.
Setting: Representative sample of adults in Porto, Portugal.
Subjects: Data were analysed for 2404 Portuguese Caucasian adults, aged between 18 and 92 years.
Results: For total PA, males who were active had significantly higher mean intake of energy (10·76 (2570·7) vs. 9·78 (2336·9) MJ/d (kcal/d), $P < 0·001$) and lower level of protein consumption (16·9 vs. 17·6 % of energy, $P < 0·001$) compared with sedentary males. In males, the association between total PA and energy intake remained after adjustment for age, education and body mass index. Similar results were observed when occupational activity was analysed. Concerning the energy expended in leisure time, in both genders, after adjustment for the previously described variables, a significant positive association was found between PA and intake of vitamin C (g/d): $\beta = 0·12$, 99 % confidence interval (CI) 0·02, 0·21 for females and $\beta = 0·13$, 99 % CI 0·03, 0·22 for males. Leisure-time activity in females was also positively associated with intakes of fibre, vitamin E, folate, calcium and magnesium, and negatively associated with saturated fat.
Conclusions: Higher levels of PA in leisure time were associated with higher intakes of micronutrients and lower intakes of saturated fat, particularly in females. For total and occupational PA, similar nutrient intake was observed between active and sedentary individuals.

Keywords
Dietary intake
Physical activity
Lifestyle

Among identified cardiovascular risk factors[1], physical inactivity and inappropriate dietary habits[2,3] have been described as major modifiable behaviours associated with poor health. Sedentary behaviour combined with an unhealthy diet is responsible for a large proportion of deaths and it has been hypothesised that changes in nutrition and physical activity (PA) patterns could reverse this situation[4]. The World Health Assembly of 2004 proposed a Global Strategy on Diet, Physical Activity and Health, highlighting the importance of the possible additive or synergistic effects of these factors in the design of health promotion interventions[3].

A better understanding of the relationship between PA and diet could enhance efforts to improve health outcomes for which both diet and sedentary behaviour are risk factors[5]. The importance of this relationship is underlined as part of the 10 general points, highlighted by Prentice *et al.*[4], concerning the need to explore the association between nutrition and PA and their relationship with chronic disease.

A high prevalence of obesity (26·1 % in females and 13·9 % in males) has already been described in the present study's population[6]. This prevalence is, in part, the result of an imbalance between regular PA and healthy dietary choices, leading to the hypothesis that changes in nutrition and PA patterns could reverse the obesity epidemic[4]. Some studies[7–10] have suggested that good or poor dietary practices and PA levels 'cluster' within individuals, but is not yet clear what type and intensity of activity is associated with dietary choices. As PA has been defined[11] as all movements in everyday life, including work, recreation, exercise and sporting activities, it seems relevant to investigate whether there is a differential effect between the type of PA and dietary intake.

**Corresponding author:* Email mcamoes@med.up.pt