The practice of sports during adolescence and physical recreational activities during adulthood

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ABSTRACT

Basis and purposes: Physical inactivity is an important risk factor to chronic diseases. Results shown in the literature are controvert concerning to the sportive activities practice in childhood and adolescence, as well as physical activities during adulthood. The purpose of this study was to verify the frequency of the leisure physical activity (LPA) in young adults, and to determine whether the practice of sports during the adolescence years influenced or not such activity. **Methods:** It was performed a transversal inquiry-type study during from November, 2003 to April, 2004 in 170 students of Medicine schools performing their internship stage in Pediatrics and toco-gynecology at the Instituto Materno Infantil de Pernambuco (IMIP). It was considered athletes who said to have practiced some kind of sports for at least two consecutive years between ages from 10 to 19 years. The physical activity performed at that moment was measured through information of the LPA performed during the last week previous to the application of the questionnaire, searching for practices of some kind of physical activity which could cause sudoresis and fast breathing. It was considered physically active those individuals who spent at least 150 minutes of physical activity/week. **Results:** Only 22.5 (35/155) of the individuals were performing LPA. Among those who were athlete during the adolescence, the practice of LPA in the adulthood was higher; 26.8 (33/123) compared to those who were not athletes, 6.2% (2/32); $p < 0.03$ (tabela 1). However, the presence of over-weight or obesity, arterial hypertension, smoking habits, and parental antecedents of early atherosclerotic disease was not different among those groups with higher and lower LPA. **Conclusion:** Practicing sports activities during the adolescence contributes to the LPA in the adulthood.

Keywords: Physical exercise. Recreational activities. Sports.

INTRODUCTION

Cardiovascular diseases (CVD) continuingly represent the main morbidity-mortality cause in richest countries, despite of being observed a decrease in its rates in the last decades[1]. In Brazil, they respond for 33% of the death causes, and they represent the higher spending to the Social Security System[2]. Among the risk factors known for CVD, several of them have presented a decrease in richer countries, such as smoking habits, systemic blood hypertension, diabetes, and the circulating level of lipids. However, obesity and sedentarism have shown an ascending curve. In the USA, there are 10 million coronariopathic persons, originating 100,000 interventions/year[3]. Controlled studies with these patients evidenced that people entering in a regular schedule for physical activity has a 25% decrease in the death risk[4,5].

Epidemiologic studies, such the one performed by Groot *et al.*[6], Prentice *et al.*[7], Lees and Booth[8], point out a strong association between physical activity or capacity and health. The physical inactivity is an independent risk factor for cardiovascular disease, blood hypertension, obesity, and hypercholesterolemia[4,5]. Blair *et al.*[9], and Erikssen *et al.*[10] have shown that a better physical capacity in middle aged adults reduced in more than 50% the general mortality index related to all-cause deaths. Prospective populational studies have shown that the physical activity decreases the risk for coronary disease; the meta-analysis in more than 40 studies has shown that the risk for coronary disease in inactive persons is 1.9 times higher compared to active persons, regardless other risk factors. Such individual risk is compared to the risk associated to smoking habits, hypertension, and hypercholesterolemia[11].

The practice of physical activity decreases the risk for atherosclerosis and its consequences (angina, myocardial infarction, cerebral vascular disease), helping to control obesity, blood hypertension, diabetes, osteoporosis, dislipedemias, and diminishing the risk for osteomuscular affections and some types of cancer (colon and breast). It further contributes to controlling anxiety, depression, chronic obstructive pulmonary disease, asthma, besides of propitiating a better self-esteem and helping the well-fare and socializing the individual.

Despite all these scientific evidences, the major part of the human kind lives a sedentary life. American studies show that 54% of adult people do not practice any regular physical activity, i.e., more than half adolescents have a sedentary life, with an even higher number of female individuals[3,12]. In Brazil, almost half of the students has no regular physical education classes; the percentage that was of 42% in 1991 fell to 25% in 1995[13]. An study performed in public schools in Rio de Janeiro pointed a sedentarism level of 85% among male adolescents, and 94% of female individuals[14]. The participation in physical activities declines considerably while individuals grow, especially from the adolescence to the young adult. A few studies identify some risk factors to the sedentarism: physically inactive parents, schools with no sports activities, females, living in urban areas, TV inside the child's room[15].

Despite of some longitudinal studies indicating a weak or modest correlation between physical activity during childhood and adulthood[16], other studies point out that physically active children and adolescents present a lower trend to become sedentary adults[17,18]. Thus, the purpose of this study was to verify the frequency of practicing physical activities in young adults, smoking habits, and parental antecedents for degenerative chronic diseases, besides of determining if practicing sports by individuals in the adolescence would decrease the sedentarism in adulthood.

METHODS

It was performed an observation, transversal, inquiry-type study at the Instituto Materno Infantil de Pernambuco (IMIP), a duly certified College Institution by the Ministry of Education which develops graduating programs (internship for medical school students in Pediatrics and Toco-Gynecology), and post-graduation in the maternal-childish area. It was considered to participate in this study

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all 170 students of the Medicine course who came from medical schools of the State of Pernambuco (UPE), and from the Federal University of Pernambuco (UFPE) who performed their internship period in Pediatrics and Toco-Ginecology from November, 2003 to April, 2004. Those who presented some medical counterindication for practicing physical activities were excluded from the study.

The sampling was dimensioned to estimate the sedentarism prevalence as an estimate error not higher than 5%, and a confidence level of 95%. The size of the sampling, calculated by the EPI-6 software, with a confidence interval of 95% was of 155 participants. Upon the admission of a sampling loss of 15%, it was estimated a casuistic of 170 participants.

It was considered as adolescent athletes those who said to have performed any kind of sports activities for at least two consecutive years during the ages of 10 to 19 years old. The physical activity presently performed was measured through information on the use of their leisure time (LPA) in the last week previous to the application of the inquiry for practicing some kind of physical activity (walking, running, pedaling, swimming, playing, exercising, etc.) that would cause sudoresis and fast breath. It was used the validate questionnaire, "The Minnesota Leisure Time Physical Activity Questionnaire (MLTPAQ)"[19], being considered as physically active those individuals who spent at least 150 minutes of physical activity per week.

The variable and continuing body mass index (BMI) were measured through the equation BMI = weigh t(kg)/height $(m)^2$ expressed in kg/m^2, being considered as over-weighted or obese those individuals who presented respectively a BMI > 25 or > 30. It was considered smokers those individuals who had smoked more than a cigarette per day. The blood pressure was measured according to recommendations contained in the Task Force Report[20], being considered hyper-tense individuals those who presented a systolic or diastolic blood pressure above 90% for their age.

Data were collected through a pre-coded standard form, which was fulfilled by one of the researchers during an interview with each of the participants. The associations between several categories were evaluated through the chi-square evaluation test.

The study followed determinations set by the Helsinki Statement and the 196/6 Resolution by the National Health Council, besides of being approved by the Ethics Committee of the IMIP. It was requested a free and clarified consent term from every individual participating of the study.

RESULTS

It was selected 158 individual eligible for the doctorship, being 95 from UPE and 60 from UFPE. Three of the students were excluded: two for bearing herniated disk, and one for scoliosis. From all 155 students who effectively participated in the study, 82 (52.9%) were male, and 73 (47.1%) were female, with ages varying from 22 to 30 years, with mean ± standard deviation equal to 24.2 ± 1.6 years, and average of 24 years.

The prevalence of sedentarism was estimated in 77.4% (120/155: CI 95%: 70.8 to 84.0%). It was noted no significant statistical difference related to the gender (male: 76.8 (63/82) for sedentarism; female: 78.1% (57/73); chi-square test: p = 0.852).

It was noted no significant statistical difference between the mean age of the physically active individuals (24.1 ± 1,7 years), and sedentary individuals (24.3 ± 1.5 years) as well (*t* Student test: p = 0.680).

The overweight or obesity was noted in 9 (25.7%) of the physically active students, and in 30 (25.0%) of sedentary students. The differences between percentages was not statistically significant (chi-square test: p = 0.932).

The percentage of smokers was similar among physically active students, 5.7% (2/35), and sedentary students, 3.3% (4/120) (Fisher's exact test: p = 0.613).

The increase in the blood pressure was noted in 5 physically active students (12.5%). Among sedentary students, it was noted 19 hyper-tense individuals (15.7%). The difference between the ratio of hyper-tense individuals in both groups did not attained statistical significance (chi-square test: p = 0.824).

Parental antecedents of early atherosclerotic disease was noted in 9 of the physically active individuals (25.7%), and in 30 (25.0%) of sedentary students. The difference of such ratios was not statistically significant (chi-square test: p = 0.932).

In the studied sampling, sedentarism increased from 20.6% in adolescence to 79.4% in adulthood, by the time of the research. The increment observed was statistically significant (McNemar test: p < 0.001; table 1). The odds ratio for matched samples was of 45 (90/2; CI 95%: 12.1 to 377.3).

Between Medicine students that were athletes during the adolescence, the practice of LPA in adulthood was higher: 33/123 (26.8%) versus 2/32 (6.2%); p < 0.03. From 34 physically active young adults, 32 (94.1%) were athletes during adolescence.

The commonest sports practices in the adolescence were: swimming (25.2%), soccer (22.7%), volleyball (20.3%), athletics (7.3%), basketball (6.5%), and others (18.0%). Physical activities performed in the adulthood were: pumping iron (50.0%), running/walking (26.6%), gymnastics (20.5%), and swimming (2.9%).

TABLE 1
Sedentarism in the adulthood for sports practicing and non-practicing during adolescence

Sedentarism in the adolescence	Sedentarism in the adulthood		
	Yes (%)	No (%)	Total (%)
Yes	30 (19.4)	2 (1.3)	32 (20.6)
No	90 (58.0)	33 (21.3)	123 (79.4)
Total	120 (77.4)	35 (22.6)	155 (100.0)

* Adulthood by the time of the research.

DISCUSSION

The high prevalence of physical inactivity has been shown in several national and international studies[14,21,22], whereby it was noted similar prevalence to those found in our study. Barros and Naja[23], in a research with representative sampling composed by industrial workers from Southern Brazil showed a prevalence of physical inactivity in 68.1%. Silva and Molina[14] verified sedentarism indexes above 80% among adolescents who studied in public schools in the Rio de Janeiro City. Monteiro *et al.* noted only 3.3% of Brazilian individuals who performed more than half hour/day of LPA five days a week[24]. In Pelotas (RS) Hallal *et al.*[25] observed a physical inactivity prevalence between 38 to 41% to ages averaging from 20 to 65 years old. This was the first study made in Brazil using the International Physical Activity Questionnaire (IPAQ, http://www.ipaq.ki.SE) developed by researchers from several countries, and supported by the World Health Organization (WHO) and the USA's Centers for Disease Control (CDC), as it also evaluates the total amount of time spent in physical activities at home, on the transportation, and at work. Such evaluation criterion is invested of major importance in poorest countries, where the transportation and occupation activities impose a significant energetic waste to those populations.

It was noted no differences to the LPA practice related to the age, possibly because we had been studying an age group with few age variation, individuals from 22 to 30 years old. Several section and longitudinal studies indicate that the physical activity generally decreases from 1 to 20% per year[15,18]. Despite the fact we have found a higher number of young over-weighted or obese adults among the physically inactive individuals, such difference did not successfully presented a significant difference. The possibility that

some of those over-weighted or obese students were involved in physical activity programs to control their body weight was not investigated in this study.

It is possible that if in our study the sampling calculations have been dimensioned to such purpose, the results of statistical tests would point such differences. Kvaavik *et al.*[17] noted that BMI in the adolescence trends to be repeated in young adulthood. It was noted similar behavior as to the blood pressure. Related to the parental antecedents, the number was higher among the physically active, although it was not found any significant difference. There were a low number of smokers in both groups.

In our data, only two among 34 non-athlete adolescents became physically active adults. To be physically active during adolescence seems to increase the odds for developing sedentary habits in the adulthood[26,27]. However, some studies showed a weak relationship between physical activity during the childhood and adulthood[28]. The term "tracking" used in the English language has been defined as the relative stability of a given variable along the years, i.e., the forecasted measurement performed in the beginning of life to the value of the same variable along the lifetime. Our findings are similar to several studies that observed that practicing sports activities during the childhood and adolescence interferes in the LPA both in young adults and elderly people[29,30]. To participate in school's sports activities may grant skills and amusement that help founding sportive activity during the adulthood, thus contributing to decrease the incidence of CVD[31].

In view of the importance of the physical activity to keep the health, its measurement has been acquiring great importance within the public health context. However, several methods have been used to evaluate such parameter, thus making difficult to compare the results. In our study, physical inactivity was defined only in those leisure hours used practicing physical activities (LPA), according to orientation supplied by the American College of Sports Medicine[20]. Despite of being one of the most used methods[21,22], it does not measure the caloric expenditure consumed while performing daily domestic activities, on transportation, and at work.

However, the impact of such physical activity on the researched casuistic – Medicine students – seems to be of low intensity, as these students have good socio-economical status, they usually do not participate in domestic activities, and have their own transportation added to the fact that those activities performed in the Medicine internship does not impose high energetic expenditures. Thus, we believe that when measuring physical activity only in those leisure hours may reflect satisfactorily the sedentary way of life for such studied group.

As to a possible recalling bias while ranking athlete adolescents, i.e., the information supplied that they practiced some kind of continuous sports for at least 24 months from 10 to 19 years old, the fact that we have been studying young adults with mean age around 24 years old makes such possibility less probable due to the relative short time interval from the sports practice log for at least two consecutive years. Some studies have applied that same methodology even in elder populations[23,24].

As the physical inactivity is an important risk factor for chronic diseases and data found in the literature are still controversial concerning to the practice of sports activities in childhood and adolescence and physical activity in the adulthood, we expect that the original feature of our study has contributed for a better understanding on the theme. Despite the limitations of the study and the need for further researches containing prospective cohort drawings to confirm these findings, practicing sports activities in the adolescence seems to contribute in a very important way to a less sedentary adulthood. As the physical activity habits acquired during childhood and adolescence trend to be kept during the individual's lifetime, it seems important to us that policies stimulating sports activities in these younger age groups must be implemented.

All the authors declared there is not any potential conflict of interests regarding this article.

REFERENCES

1. WHO. Sedentary life-style: a global public health problem. Acessado em 12/05/03 no endereço: http://www.who.int/hpr/physactiv/sedentary.lifestyle1.shtml
2. Ministério da Saúde. DATASUS. Estatísticas vitais – Mortalidade e nascidos vivos. Acessado em 12/05/03 no endereço http://portal.saude.gov.br/saude/
3. Morbidity and Mortality Weekly Report. Increasing physical activity. A report on recommendations of the Task Force on Community Preventive Services. MMWR 2001;50:1214-5.
4. Pate RR, M Pratt, SN Blair. Physical activity and public health: a recommendation from the Centers for Disease Control and Prevention and the American College of Sports Medicine. JAMA 1995;273:402-7.
5. Erlichman J, Kerbey AL, James WP. Physical activity and its impact on health outcomes. Paper 1: The impact of physical activity on cardiovascular disease and all-cause mortality: an historical perspective. Obes Rev 2002;3:257-71.
6. de Groot LC, Verheijden MW, de Henauw S, Schroll M, van Staveren WA, SENECA Investigators. Life-style, nutritional status, health, and mortality in elderly people across Europe: a review of the longitudinal results of the SENECA study. J Gerontol A Biol Sci Med Sci 2004;59:1277-84.
7. Prentice RL, Willett WC, Greenwald P, Alberts D, Bernstein L, Boyd NF, et al. Nutrition and physical activity and chronic disease prevention: research strategies and recommendations. J Natl Cancer Inst 2004;96:1276-87.
8. Lees SJ, Booth FW. Sedentary death syndrome. Can J Appl Physiol 2004;29: 447-60.
9. Blair SN, Kohl HW, Barlow CE, Paffenbarger RA Jr, Gibbons LW, Macera CA. Changes in physical fitness and all-cause mortality. A prospective study of health and unhealthy men. JAMA 1995;12;273:1093-8.
10. Erikssen G, Liestol K, Bjornholt J, Thaulow E, Sandvik L, Erikssen J. Changes in physical fitness and changes in mortality. Lancet 1998;5:352:759-62.
11. Miller TD, Balady GJ, Fletcher GF. Exercise and its role in the prevention and rehabilitation of cardiovascular disease. Ann Behav Med 1997;19:220-9.
12. NIH Consensus Development Panel on Physical Activity and Cardiovascular Health. JAMA 1996;276:241-6.
13. Néri M, Pinto A, Soares W, Costilla H. Retratos da deficiência no Brasil. Rio de Janeiro: FGV/IBRE/CRS, 2003;188 p.
14. Silva RCR, Malina RM. Nível de atividade física em adolescentes do Município de Niterói, Rio de Janeiro, Brasil. Cad. Saúde Pública 2000;16:1091-7.
15. Malina RM. Physical activity and fitness: pathways from childhood to adulthood. Am J Hum Bio 2001;13:162-72.
16. Seefeldt V, Malina RM, Clark MA. Factors affecting levels of physical activity in adults. Sports Med 2002;32:143-68.
17. Kvaavik E, Tell GS, Kleep KI. Predictors and tracking of body mass index from adolescence into adulthood: follow-up of 18 to 20 years in the Oslo Youth Study. Arch Ped Adolesc 2003;157:1212-8.
18. Jansz KF, Dawson JD, Mahoney LT. Tracking physical fitness and physical activity from childhood to adolescence: the Muscatine study. Med Sci Sports Exer 2000;32:1250-7.
19. Slinde F, Arvidsson D, Sjoberg A, Rossander-Hulthen L. Minnesota leisure time activity questionnaire and doubly labeled water in adolescents. Med Sci Sports Exerc 2003;35:1923-8.
20. National High Blood Pressure Education Program Working Group on Hypertension Control in Children and Adolescents. Update on the 1987 Task Force report on high blood pressure in children and adolescents. Pediatrics 1996;88:649-58.
21. Altieri A, Tavani A, Gallus S, La Vecchia. Occupational and leisure time physical activity and the risk of nonfatal myocardial infarction in Italy. Ann Epidemiol 2004; 14:461-6.
22. Gómez LF, Mateus JC, Cabrera G. Leisure-time physical activity among women in a neighborhood in Bogota, Colombia: prevalence and socio-demographic correlates. Cad Saude Publica 2004;20:1103-9.
23. Barros MV, Nahas MV. Health risk behaviors, health status self-assessment and stress perception among industrial workers. Rev Saude Publica 2001;35:554-63.

24. Monteiro CA, Conde WL, Matsudo SM, Matsudo VR, Bonsenor IM, Lotufo PA. A descriptive epidemiology of leisure time physical activity in Brazil, 1996-1997. Rev Panam Salud Publica 2003;14:246-54.
25. Hallal PC, Victora CG, Wells JCK, Lima RC. Physical inactivity: Prevalence and associated variables in Brazilian adults. Med Sci Sports Exerc 2003;35:1894-900.
26. Tammelin T, Laitinen J, Nayha S. Change in the level of physical activity from adolescence into adulthood and obesity at the age of 31 years. Int J Obes Relat Metabol Disord 2004;28:775-82.
27. Hirvensalo MT, Lintunen T, Rantanen T. The continuity of physical activity: a retrospective and prospective study among older people. Scand J Med Sci Sports 2000;10:37-41.
28. Kimm SY, Glynn NW, Kriska AM, et al. Longitudinal changes in physical activity in a biracial cohort during adolescence. Med Sci Sports Exerc 2000;32:1445-54.
29. Malina RM. Tracking of physical activity and physical fitness across the life-span. Res Q Exerc Sport 1996;67:S48-S71.
30. Telama R, X Yang, L Laakso, J Viikari. Physical activity in childhood and adolescence as predictor of physical activity in young adulthood. Am J Prev Med 1997; 13:317-23.
31. Houston TK, Meoni LA, Ford DE, Brancati FL, Cooper LA, Lê Liang KY, Klag MJ. Sports ability in young men and the incidence of cardiovascular disease. Am J Med 2002;112:733-4.