



ORIGINAL ARTICLE

Cardiovascular risk profile of high school students: A cross-sectional study



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KEYWORDS

Physical activity;
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Abstract

Introduction: Disease prevention should begin in childhood and lifestyles are important risk determinants of cardiovascular disease. Awareness and monitoring of risk is essential in preventive strategies.

Aim: To characterize cardiovascular risk and the relationships between certain variables in adolescents.

Methods: In a cross-sectional study, 854 adolescent schoolchildren were surveyed, mean age 16.3 ± 0.9 years. Data collection included questionnaires, physical examination, charts for 10-year relative risk of mortality, and biochemical assays. In the statistical analysis continuous variables were studied by the Student's t test and categorical variables by the chi-square test and Fisher's exact test, and each risk factor was entered as a dependent variable in logistic regression analysis.

Results: Physical activity was insufficient in 81% of students. The daily consumption of soup, salad or vegetables, and fruit was, respectively, 37%, 39% and 21%. A minority (6%) took ≤ 3 and 77% took ≥ 5 meals a day. The prevalence of each risk factor was as follows: overweight 16%; smoking 13%; hypertension 11%; impaired glucose metabolism 9%; hypertriglyceridemia 9%; and hypercholesterolemia 5%. Out-of-school physical activity, hypertension and overweight were more prevalent in males ($p < 0.001$). Females had higher levels of cholesterol ($p < 0.005$) and triglycerides ($p < 0.001$). A quarter of the adolescents had a relative risk score for 10-year cardiovascular mortality of ≥ 2 . Overweight showed a positive association with blood pressure, changes in glucose metabolism and triglycerides, and a negative association with number of daily meals.

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PALAVRAS-CHAVE

Atividade física;
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 Obesidade;
 Risco;
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Conclusions: The results demonstrate the need for action in providing and encouraging healthy choices for adolescents, with an emphasis on behavioral and lifestyle changes aimed at individuals, families and communities.

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Perfil de risco cardiovascular de adolescentes escolarizados: um estudo transversal**Resumo**

Introdução: A prevenção deve começar na infância e o estilo de vida é um determinante importante da doença cardiovascular. O conhecimento e monitorização do risco cardiovascular são essenciais numa estratégia preventiva.

Objetivo: Caracterizar o risco cardiovascular e as relações entre algumas variáveis em adolescentes escolarizados.

Métodos: Foram observados 854 estudantes, 16,3±0,9 anos de idade, num estudo transversal. A colheita de dados incluiu questionários, exame físico, tabela do risco relativo da mortalidade cardiovascular a dez anos, doseamentos bioquímicos. A análise estatística incide sobre variáveis contínuas e categoriais e fatores de risco como variáveis dependentes (regressão logística).

Resultados: Atividade física insuficiente 81%. Consumo diário de sopa, salada/legumes e frutas caracterizou 37, 39 e 21% dos alunos. Uma minoria (6%) fazia diariamente ≤3 refeições e 77% ≥5 refeições. Prevalência dos fatores de risco: excesso de peso 16%; tabagismo 13%; hipertensão arterial 11%; anomalias do metabolismo da glicose 9%; hipertrigliceridemia 9%; hipercolesterolemia 5%. Atividade física extracurricular, hipertensão e excesso de peso mais prevalentes no sexo masculino ($p<0,001$), enquanto nas adolescentes foram a hipercolesterolemia ($p<0,005$) e hipertrigliceridemia ($p<0,001$). Um quarto dos adolescentes com risco relativo de mortalidade cardiovascular a dez anos ≥2. Excesso de peso revelou relação positiva com pressão arterial, alterações metabolismo da glucose e triglicérideos e negativa com número de refeições diárias. **Conclusões:** Os resultados evidenciam a necessidade de ações de fomento e incentivo de escolhas saudáveis pelos adolescentes, com ênfase nas mudanças de comportamento ao nível dos indivíduos, famílias e comunidades.

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Introduction

Despite the advances of the last 50 years, strategies for cardiovascular prevention have not had an equivalent impact to the progress of knowledge. Although the majority of deaths from cardiovascular disease (CVD) are preventable or treatable, CVD remains the leading cause of death in most developed countries.

The development of atherosclerotic disease is a continuum in which the vessel passes from a healthy state, through an intermediate stage that is influenced by traditional, genetic and environmental risk factors, until it reaches the clinical stage. In recent decades evidence has accumulated on cardiovascular risk throughout life: risk exposure begins with influences during pregnancy and continues into childhood, adolescence and adulthood.¹ Children and young people who have a high value of a risk factor will keep it throughout life, but achieving lower levels of this factor when young will have a greater impact on the disease than if it is detected and treated in adulthood.² Nevertheless, strategies for CVD prevention are designed mainly for patients and high-risk individuals, particularly

middle-aged and elderly adults. Furthermore, the most common approach has been based on the individual and on medication. Attempts to raise awareness and to promote changes in lifestyles have had little success, even in secondary prevention,³ but prevention in young people could have many benefits. Its guiding principles are those of a community-based approach to prevention, based on health education and individual attitudes that are also dependent on the environment.⁴ Indeed, deviant behaviors result from the dynamics between biological and social factors that favor or limit the diversity of individual characteristics. At the same time, the World Health Organization (WHO) recognizes that the most prominent non-communicable diseases (NCDs), namely cardiovascular disease, cancers, chronic respiratory diseases and diabetes, are linked to tobacco use, alcohol abuse, an unhealthy diet, and physical inactivity.⁵ As a corollary, the WHO, working in partnership with other organizations with decision-making powers in public health, has developed strategic action plans for the prevention and control of NCDs.⁶ Obesity also merits special attention because it results from some of the same factors and is implicated in other NCDs. This does not mean that all factors are

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