



ORIGINAL ARTICLE

Metabolic risk in schoolchildren is associated with low levels of cardiorespiratory fitness, obesity, and parents' nutritional profile[☆]



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KEYWORDS

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Parents

Abstract

Objective: Verify the association between metabolic risk profile in students with different levels of cardiorespiratory fitness and body mass index, as well as the nutritional status of their parents.

Methods: A cross-sectional study comprising 1.254 schoolchildren aged between seven and 17 years. The metabolic risk profile was calculated by summing the standardized values of high density lipoproteins and low density lipoproteins, triglycerides, glucose and systolic blood pressure. The parents' nutritional status was evaluated by self-reported weight and height data, for body mass index calculating. The body mass index of schoolchildren was classified as underweight/normal weight and overweight/obesity. The cardiorespiratory fitness was assessed by 9-minute running/walk test, being categorized as fit (good levels) and unfit (low levels). Data were analyzed using prevalence ratio values (PR).

Results: The data indicates a higher occurrence of developing metabolic risk in schoolchildren whose mother is obese (PR: 1.50; 95% CI: 1.01, 2.23), and even higher for those whose father and mother are obese (PR: 2, 79, 95% CI: 1.41; 5.51). Students who have low levels of cardiorespiratory fitness and overweight/obesity have higher occurrence of presenting metabolic risk profile (PR: 5.25; 95% CI: 3.31; 8.16).

Conclusion: the occurrence of developing metabolic risk in schoolchildren increase when they have low levels of cardiorespiratory fitness and overweight/obesity, and the presence of parental obesity.

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PALAVRAS-CHAVE

Escolares;
Aptidão
cardiorrespiratória;
Índice de massa
corporal;
Pais

Risco metabólico em escolares está associado com baixos níveis de aptidão cardiorrespiratória, obesidade e perfil nutricional dos pais

Resumo

Objetivo: Verificar se há associação entre o perfil de risco metabólico em escolares com diferentes níveis de aptidão cardiorrespiratória e índice de massa corporal, bem como com o perfil nutricional de seus pais.

Métodos: Estudo transversal constituído por 1.254 escolares com idade entre sete e 17 anos. O perfil de risco metabólico foi calculado por meio da soma dos valores estandarizados de lipoproteína de alta densidade e lipoproteína de baixa densidade, triglicérides, glicose e pressão arterial sistólica. O perfil nutricional dos pais foi avaliado pelos dados autorreferidos de peso e estatura, calculando-se posteriormente o índice de massa corporal. O índice de massa corporal do escolar foi classificado em baixo peso/peso normal e sobrepeso/obesidade. A aptidão cardiorrespiratória foi avaliada através do teste de corrida/caminhada de 9 minutos, sendo categorizada em apto (bons níveis) e inapto (baixos níveis). Os dados foram analisados através dos valores de razão de prevalência (RP).

Resultados: Os dados apontam maior ocorrência de desenvolvimento de risco metabólico em escolares que apresentam mãe com obesidade (RP: 1,50; IC 95%: 1,01; 2,23) e, maior ainda, em escolares que possuem pai e mãe obesos (RP: 2,79; IC 95%: 1,41; 5,51). Escolares que apresentam baixos níveis de aptidão cardiorrespiratória e sobrepeso/obesidade possuem maior ocorrência de perfil metabólico de risco (RP: 5,25; IC 95%: 3,31; 8,16).

Conclusões: a ocorrência de desenvolvimento de risco metabólico em escolares aumentam quando estes apresentam baixos níveis de aptidão cardiorrespiratória e sobrepeso/obesidade, assim como na presença de obesidade dos pais.

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Introduction

The rapid increase in the prevalence of overweight and obesity in Brazilian children and adolescents¹ has resulted in a growing interest about the role of lifestyle in the development of the metabolic risk profile (MRP) in children and adolescents. Based on the records of this alarming increase in overweight and obesity, their consequences for health have been demonstrated, such as the occurrence of metabolic syndrome (MS), which represents a condition of adulthood related to cardiovascular morbidity. However, MS has also been identified in children and adolescents, showing a direct association with excess weight.²⁻⁴ Studies have shown that metabolic risk develops during childhood and adolescence, leading to an increased risk of cardiovascular events and occurrence of type 2 diabetes.^{2,3}

Consequently, studies that aim to explore the risk factors of cardiovascular diseases in children and adolescents are being emphasized, focusing on the centralization of prevention – considering, in addition to the life styles of young individuals, the influence of family involvement.⁵ It has therefore been verified that adults with low cardiorespiratory fitness are associated with cardiovascular risk factors such as hypercholesterolemia, obesity, and type 2 diabetes.⁶ However, the evidence is not yet clear in children and adolescents, but suggests that the association between obesity and cardiovascular risk is mediated by aerobic fitness since childhood.⁷ It can also be observed that the cardiometabolic risk is higher in children and adolescents with overweight and obesity who perform light physical activity than in those who practice vigorous activity.⁸

Several studies have shown that low cardiorespiratory fitness (CRF) is a significant independent risk factor for future cardiometabolic disease in adulthood. No less importantly, it is suggested that the parental nutritional profile is an important predictor of overweight and obesity in children and adolescents.⁹ Nevertheless, considering the consequences of this disorder, there is already evidence of an association between the parents' lifestyle and nutritional profile with an early risk of developing a metabolic risk profile.^{10,11} The possibility of obese parents of having children with high cardiometabolic risk is explained by the likely influence not only of family involvement, but also of genetic factors, which account for approximately 30%–40% of factors responsible for early development of diseases in childhood and adolescence. However, it is worth mentioning the importance of focusing research on factors related to lifestyle, both of young individuals and their parents, in order to obtain data to better organize interventions.

The above statements justify the importance of studies that seek to understand the early development of MS in children and adolescents and the need to include a large number of potential associated factors. Thus, it is suggested that low cardiorespiratory fitness may be an independent risk factor for future cardiometabolic disease in adulthood.¹² Nevertheless, when prevention is considered, some factors have been highlighted as being both important and modifiable, results that justify the need to comprehend the association between obesity⁷ and parents' nutritional profile¹¹ vs. cardiorespiratory fitness in a young Brazilian population.

Thus, the present study aims to determine whether there is an association between MRP in students with different

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