



ORIGINAL ARTICLE

Association between general and abdominal obesity with high blood pressure: difference between genders^{☆,☆☆}



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KEYWORDS

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Abstract

Objective: To assess the association between general and abdominal obesity with high blood pressure in adolescents of both genders from the public school system.

Methods: This was an epidemiological, descriptive, exploratory study, with a quantitative approach and local scope whose sample consisted of 481 high school students (aged 14–19), selected by using a random cluster sampling strategy. Blood pressure was measured through the use of automated monitor and was considered high when the pressure values were at or above the 95th percentile. The analyses were performed using the chi-squared test and binary logistic regression.

Results: The prevalence of high blood pressure was 6.4%, and it was higher among boys (9.0% vs. 4.7%, $p < 0.05$). There was no significant difference between general ($p = 0.903$) and abdominal obesity ($p = 0.157$) when genders were compared. After adjusting for age, high blood pressure was associated with general (OR = 6.4; $p < 0.001$) and abdominal obesity (OR = 7.0; $p < 0.001$)

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^{☆☆} Study carried out at Faculdade Associação Caruaruense de Ensino Superior e Técnico (ASCES), Caruaru, PE, Brazil.

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PALAVRAS-CHAVE

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only among boys, when comparing the fourth quartile with the first quartile of body mass index ($\leq 18.6 \text{ kg/m}^2$ vs. $\geq 23.5 \text{ kg/m}^2$) and waist circumference ($\leq 69 \text{ cm}$ vs. $\geq 80.1 \text{ cm}$).

Conclusion: It was observed that general and abdominal obesity are associated with high blood pressure only in boys, regardless of age.

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Associação entre a obesidade geral e abdominal com a pressão arterial elevada: diferença entre gêneros

Resumo

Objetivo: Analisar a associação entre obesidade geral e abdominal com a pressão arterial elevada em adolescentes de ambos os gêneros da rede de ensino público.

Métodos: Trata-se de um estudo epidemiológico, descritivo, exploratório, com abordagem quantitativa e abrangência municipal cuja amostra foi constituída de 481 estudantes (14-19 anos) do ensino médio, selecionado por meio de uma estratégia de amostragem aleatória de cluster. A pressão arterial foi medida através da utilização de equipamentos automáticos, sendo considerada elevada quando os valores pressóricos estivessem iguais ou acima do percentil 95. As análises foram realizadas através do teste de Qui-quadrado e da regressão logística binária.

Resultados: A prevalência de pressão arterial elevada foi de 6,4%, sendo maior entre os rapazes (9,0% vs. 4,7%, $p < 0,05$). Não foi observada diferença significativa entre a obesidade geral ($p = 0,903$) e abdominal ($p = 0,157$) quando comparados os gêneros. Após o ajuste pela idade, a pressão arterial elevada foi associada com a obesidade geral (OR = 6,4; $p < 0,001$) e abdominal (OR = 7,0; $p < 0,001$) apenas entre os rapazes, quando comparado o quarto quartil com o primeiro quartil do índice de massa corporal ($\leq 18,6 \text{ Kg/m}^2$ Vs $\geq 23,5 \text{ Kg/m}^2$) e da circunferência da cintura ($\leq 69 \text{ cm}$ Vs $\geq 80,1 \text{ cm}$).

Conclusão: Foi observado que a obesidade geral e abdominal está associada com a pressão arterial elevada apenas entre os rapazes, independentemente da idade.

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Introduction

High blood pressure (HBP) is considered a major risk factor for cardiovascular disease for adults, as well as children and adolescents.^{1,2} Its diagnosis and early treatment can prevent the occurrence of future adverse cardiovascular events, since HBP in childhood is a predictor of hypertension in adulthood.³ In Brazil, the prevalence of HBP in children ranges from 2.5%⁴ to 44.7%⁵; as it is asymptomatic, the identification and treatment of HBP is often neglected.⁶

By consensus, general and abdominal obesity are considered as predisposing factors for HBP onset⁷; moreover, excess body fat accumulation in the early stages of life is associated with the onset of cardiovascular and metabolic diseases in adulthood.⁸ However, there is evidence demonstrating that body fat distribution is more important than obesity alone.^{9,10} In this sense, it has been observed that abdominal fat accumulation is closely related to HBP, and it is considered the biggest contributor to metabolic complications of the obese population.¹¹

Another factor that can influence blood pressure (BP) values is the difference between genders.^{12,13} Studies have confirmed that boys have higher BP than girls.¹⁴⁻¹⁶ However, the association between obesity and HBP is usually assessed, but the interaction in relation to gender is not tested,

and this factor can distort the found results.^{1,16} Therefore, the objective of this study was to analyze the association between general and abdominal obesity with HBP in adolescents from public schools, while considering the difference between genders.

Methods

This was a descriptive study with a quantitative approach that integrated a school-based cross-sectional epidemiological survey of municipal scope. The sample consisted of students aged 14–19 years, of both genders, enrolled in the state public high schools in the city of Caruaru, state of Pernambuco, Brazil. The total population was estimated at 8833 young individuals distributed in 15 schools, according to the State Secretariat of Education and Culture.

The following parameters were used to calculate sample size: 95% of confidence interval; maximum tolerable error of 2 percentage points; design effect (deff) = 2; and, because this study comprehended the analysis of multiple risk behaviors and different frequencies of occurrence, the estimated prevalence was defined as 50%. Additionally, to minimize the limitations caused by eventual losses in the application and/or inadequate completion of the questionnaires, it was decided to add 20% to the sample size.

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