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ORIGINAL ARTICLE

Association of junk food consumption with high blood pressure and obesity in Iranian children and adolescents: the CASPIAN-IV Study☆

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KEYWORDS
Junk food;
High blood pressure;
Obesity;
Anthropometric measures

Abstract
Objective: This study aimed to evaluate the association of junk food consumption with hypertension and obesity in a national sample of Iranian children and adolescents.
Methods: This nationwide study was conducted in 2011-2012 among 14,880 students, aged 6-18 years, selected by cluster sampling from 30 provinces. Weight, height, waist circumference (WC), hip circumference (HC), waist-to-hip ratio (WHR), waist-to-height ratio (WHtR), as well

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as systolic and diastolic blood pressure (BP) were measured. Junk food was divided into four categories, including salty snacks, sweets, sweetened beverages, and fast food. Subjects reported how many times they had consumed each item (daily, weekly, and seldom).
Results: The intake of sweets was significantly associated with anthropometric indices and BP levels. Moreover, a significant association was found between fast food consumption, BP levels, and anthropometric indices (except for WHtR and WHR). Sweet beverages consumption was significantly associated with anthropometric indices; however, the consumption of salty snacks was only significantly associated with height, HC, and WHR. The risk of general obesity (OR: 0.75, 95% CI: 0.65-0.87) and abdominal obesity (OR: 0.81, 95% CI: 0.72-0.92) among participants who seldom consumed sweets was less than those who consumed daily. Also, the risk of general obesity (OR: 0.85, 95% CI: 0.74-0.97) among students that seldom consumed sweetened beverages was less than subjects who consumed them on a daily basis.
Conclusion: It was found that junk food consumption increased the risk of both general and abdominal obesity; therefore, consumption of junk food should be reduced via restricting TV advertisements and increasing taxes on junk foods.

PALAVRAS CHAVE
Junk Food;
Hipertensão Arterial;
Obesidade;
Medidas antropométricas

Associação entre o consumo de *junk food* e a pressão arterial alta e obesidade em crianças e adolescentes iranianos: o Estudo CASPIAN-IV

Resumo
Objetivo: Este estudo pretende avaliar a associação entre o consumo de *junk food* e a hipertensão e obesidade em uma amostra nacional de crianças e adolescentes iranianos.
Métodos: Este estudo nacional foi realizado entre 2011 e 2012 com 14.880 estudantes com 6-18 anos de idade, selecionados por amostra em bloco em 30 províncias. Foram medidos o peso, a estatura, a circunferência da cintura (CC), circunferência do quadril (CQ), razão cintura/quadril (RCQ), razão cintura/estatura (RCE) e a pressão arterial sistólica e diastólica (PAS e PAD). A *junk food* foi dividida em quatro categorias, incluindo lanches salgados, doces, bebidas açucaradas e *fast food*. Os indivíduos relataram quantas vezes consumiam cada um dos itens (diariamente, semanalmente, raramente).
Resultados: O consumo de doces foi associado significativamente aos índices antropométricos e níveis de PA. Além disso, havia uma associação significativa entre o consumo de *fast food* e os níveis de PA e índices antropométricos (exceto RCE e RCQ). O consumo de bebidas açucaradas foi associado significativamente aos índices antropométricos, porém o consumo de lanches salgados foi associado significativamente apenas à estatura, CQ e RCQ. O risco de obesidade geral (RC: 0,75, IC de 95%: 0,65-0,87) e obesidade abdominal (RC: 0,81, IC de 95%: 0,72-0,92) entre participantes que raramente consumiam doces era menor que naqueles que os consumiam diariamente. Além disso, o risco de obesidade geral (RC: 0,85; IC de 95%: 0,74-0,97) entre estudantes que raramente consumiam bebidas açucaradas era menor que entre indivíduos que os consumiam diariamente.
Conclusão: Constatamos que o consumo de *junk food* aumentou o risco de obesidade geral e abdominal; portanto, o consumo de *junk food* deve ser reduzido por meio da restrição de comerciais de TV e do aumento de impostos sobre esse tipo de alimento.

Introduction

In recent decades, childhood obesity has become a worldwide concern. In the United States, nearly one-third of children and adolescents are overweight or obese.[1] In addition, the prevalence of obesity in children in developing countries, including Iran, is increasing rapidly.[2] In the third nationwide survey of the CASPIAN study, 17.7% of the students were overweight or obese (19.9% of boys and 15.5% of girls). Abdominal obesity also has been reported (16.3%).[3] In addition, in childhood, obesity is a known risk factor for cardiovascular disease (including hypertension and coronary disease), type-2 diabetes, and certain types of cancer. Obese children are at increased risk of mortality and morbidity resulting from cardiovascular disease in adulthood.[4] Increased sedentary activity, lack of regular physical activity, and poor eating habits, e.g., high intake of sweetened beverages, fast foods, and sweets, may lead to obesity.[5]

Only 25% of hypertensive cases are diagnosed and treated. Many studies have shown that hypertension may