

Original Article



Gender Differences in the Prevalence of Overweight and Obesity, Associated Behaviors, and Weight-related Perceptions in a National Survey of Primary School Children in China*

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Abstract

Objective To investigate potential gender differences in the odds of overweight/obese, weight-related perceptions, and behaviors among Chinese school children.

Methods Height, weight, and a survey of weight-related perceptions and behaviors were measured in a nationally representative survey of 12,811 children in primary schools in China. Logistic regression analyses were used to assess gender differences, adjusting for confounders.

Results Boys had higher odds of being overweight/obese compared to girls within both urban [adjusted odds ratio (OR) 2.30, 95% CI 2.00 to 2.65] and rural areas (OR = 1.85, 95% CI 1.55 to 2.20). Girls reported healthier diets (e.g., daily vegetables OR = 0.79, 95% CI 0.73 to 0.85) whereas boys consumed fried food (OR = 1.21, 95% CI 1.06 to 1.38) and sugar-sweetened drinks more often (OR = 1.49, 95% CI 1.34 to 1.65). Gender differences included higher odds of boys perceiving themselves as overweight if they had more highly educated mothers (OR = 1.35, 95% CI 1.09 to 1.68), less educated fathers (OR = 0.79, 95% CI 0.63 to 0.99), and if they frequently consumed carbonated drinks (OR = 1.48, 95% CI 1.07 to 2.05).

Conclusion Childhood obesity prevention in China should be gender-focused, particularly for boys who reported an unhealthier diet but were less likely to see they were fat, even though more boys were overweight or obese than girls.

Key words: Overweight and obesity; Behaviors; Weight perception; Gender; Children

Biomed Environ Sci, 2018; 31(1): 1-11

doi: 10.3967/bes2018.001

ISSN: 0895-3988

www.besjournal.com (full text)

CN: 11-2816/Q

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*This study sponsored by the Young Scholar Scientific Research Foundation of China CDC [2010A205]; and PUMC Youth Fund and supported by the Fundamental Research Funds for the Central Universities [2017330014].

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INTRODUCTION

Overweight and obesity have become major global public health problems^[1]. In addition, waist circumference and abdominal obesity have increased over the years in China^[2]. Action needs to be directed at the main drivers of this epidemic to meet the global target of halting the rise in obesity by 2025^[3]. With the accelerating global obesity pandemic, there is a corresponding pandemic of youth classified as overweight and obese. In low and middle-income countries, where almost two in three of the world's obese people live, there are likely to be continual increases in childhood overweight or obesity^[1]. Conversely, in high income countries, trends in weight gain have been slowing in recent years^[1]. Even though existing evidence shows that the prevalence of childhood overweight or obesity has not changed or reversed in France^[4], Switzerland^[5], Sweden^[6], UK^[7], Australia^[8], or the US^[9], evidence suggests a rapid increase from 0.1% to 7.3% between 1985 and 2014 in China^[10-12].

Childhood and adolescence are critical developmental periods during which individuals establish foundations for their future health. The 'tracking' or 'carryover' of obesity from childhood to adulthood has been well-established^[13-14]. Evidence shows consistent risks as BMI reached more than 23 kg/m², especially for cardiovascular disease, cancer, diabetes, osteoarthritis, and chronic kidney disease^[15]. Without a substantial decrease in the prevalence of childhood obesity, the impact will continue to increase as the large number of currently obese children become obese adults; consequently, occurrence of diabetes, heart disease, stroke, cancer, or other weight-related diseases will also increase. Obesity prevention during childhood and adolescence is particularly important in China with the emergence of obesogenic environments coinciding with (if not caused by) China's rapid economic development.

The etiology of overweight and obesity among girls and boys may be different due to biology as well as society and culture^[16]. Boys and girls differ in body composition, patterns of weight gain, hormone biology, and the susceptibility to certain social, ethnic, genetic, and environmental factors^[17]. Understanding gender differences in child and adolescent overweight and obesity risk and associated predictors is critical for the development and implementation of policy and interventions.

Gender differences in prevalence of childhood obesity have been observed in many countries. Some studies reported higher overweight and obesity prevalence in girls than in boys^[18-20], whereas others have reported the opposite^[11,21]. Some recent studies reported gender differences with respect to the behavioral determinants of overweight, including calorie intake and physical activity^[21-23]. Similar studies have been absent in China so far. Addressing this gap is vital to provide guidance to program planners and public health decision makers with a mandate in childhood obesity prevention in China. Accordingly, the purpose of this study was to investigate potential gender differences in the odds of being, or perceiving oneself as, overweight, and in related behaviors among Chinese primary school children.

MATERIALS AND METHODS

Study Participants

A national cross-sectional survey was conducted between September and October in 2010. Participants were selected using a three-stage cluster random sampling method. For the first stage of sampling (provincial level), eight provinces, autonomous regions, or municipalities were selected from southern and northern China. This sampling strategy was described in detail in a work published elsewhere^[24]. Briefly, each province, autonomous region, or municipality was classified into three strata of lower-, middle-, and higher-economic levels according to the gross domestic product (GDP) per capita. For the second sampling stage, three counties or county-level cities were randomly selected in each stratum. For the third sampling stage, one urban and one rural primary school were randomly selected in each county or city.

Letters were sent out to families of 12,811 children in grades 4 through 6, informing parents about the study. Letters of informed consent for the students were obtained from both schools and parents. After measurements of height, weight, waist circumference, and blood pressure, all attending students were administered a survey that they filled out by themselves, and a family questionnaire that was filled out by the parents or guardians. Of all the children available in the selected schools according to class lists, 84.7% of children were included in the present study. An

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