Zhu, Lijun; Chen, Yan; Ding, Lingling; Guo, Daoxia; Wang, Linghong; Ren, Xiaohua; Gu,
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Prevalence of overweight and obesity among secondary school children aged 14 to 18
years (China)

Nutrición Hospitalaria

Original/*Obesidad*

Prevalence of overweight and obesity among secondary school children aged 14 to 18 years (China)

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Abstract

Background: Prevalence of overweight and obesity in adolescents has been increasing during recent decades. The present study aimed to assess the prevalence of obesity in 14-18 years old Anhui Secondary school children, and provide more comprehensive guidelines for intervention programs.

Methods: This cross-sectional study was conducted among 4788 children in secondary school, and date from the routine health survey was analyzed. Trained health workers took anthropometric measures, height and weight, at the school. Definition of children overweight and obesity children was based on the international age-and sex-specific body mass index reference standards proposed by the International Obesity Task Force and National Center for Health Statistics.

Results: According to the IOTF standard the prevalence of overweight (including obesity) and obesity revealed decreasing trend with age in male (overweight, from 17.3% at 14-y to 5.3% at 18-y; obesity, from 3.8% at 14-y to 2.3% at 18-y). Depending on the NCHS references used, the overall prevalence of overweight (including obesity) and obesity in male aged 14 to18 decreases from 16.4% to 11.7% and from 4.6% to 2.8%, respectively.

Conclusion: The overweight (including obesity) and obesity from14 to 18 years old have a decreasing trend, and more attention should be taken to male students in China. These findings suggest secondary school and government need to design appropriate guidelines to keep healthy for adolescents in China.

(*Nutr Hosp.* 2015;31:2006-2010)

DOI:10.3305/nh.2015.31.5.8532

Key words: *Overweight. Obesity. Students. China.*

PREVALENCIA DE SOBREPESO Y OBESIDAD ENTRE NIÑOS DE ESCUELA SECUNDARIA DE 14 A 18 AÑOS (CHINA)

Resumen

Antecedentes: La Prevalencia de sobrepeso y obesidad en adolescentes ha ido en aumento durante los últimos decenios. El presente estudio pretende evaluar la prevalencia de la obesidad en los niños de la escuela secundaria de 14 a 18 años de edad Anhui, y proporcionar directrices más amplias para los programas de intervención.

Métodos: Este estudio transversal se llevó a cabo en 4788 niños de escuela secundaria, y la fecha de la encuesta de salud de rutina fue analizado. Los trabajadores sanitarios capacitados tomaron medidas antropométricas, la altura y el peso, en la escuela. La definicion de los niños con sobrepeso y obesidad basada en la edad y sexo del índice de masa corporal estándar de referencia propuesto por el Grupo de trabajo internacional sobre obesidad y el Centro Nacional de estadísticas de salud.

Resultados: De acuerdo a la IOTF Standard la prevalencia de sobrepeso (obesidad) y la obesidad reveló disminución tendencia con la edad en varones (sobrepeso, del 17,3% en 14-y a 5,3% en 18-y; la obesidad, from 3.8% en 14-y al 2,3% en 18-y). Dependiendo de la NCHS referencias utilizadas, la prevalencia global de sobrepeso (obesidad) y la obesidad en hombres de entre 14 y 18 años de edad disminuye a partir de un 16,4% a 11,7% y del 4,6% al 2,8%, respectivamente.

Conclusión: El sobrepeso (obesidad) y la obesidad de diciembre de los 14 a los 18 años de edad tienen una tendencia a la disminucion, y más atención debe ser tomado para estudiantes varones en China. Estos hallazgos sugieren que la escuela secundaria y el Gobierno deben formular directrices apropiadas para mantener saludables a los adolescentes en China.

(*Nutr Hosp.* 2015;31:2006-2010)

DOI:10.3305/nh.2015.31.5.8532

Palabras clave: *Sobrepeso y obesidad. Estudiantes. China.*

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Introduction

In recent decades, there were growing evidence of nutrition research and policy shift focused on overweight and obesity. Because of the established health risks and substantial increases in prevalence, obesity has become a major global health challenge [1]. Many studies have documented the prevalence of overweight and obesity is growing progressively[2-4]. These previous studies point to obesity in adolescents is one of the principal health problems both in the developed and developing countries[5-7], and obesity is also a risk factor for development of other diseases, such as cardiovascular complications[8], diabetes[9], hypertension[10].

Some reports show that the prevalence of overweight among Chinese adolescents is increasing[11] and high, which in the urban population and particular in coastal big cities has reached the same level as that of some developed countries. However, the fact that the prevalence of obesity was low in most of the inland cities[12]. In addition, environmental factors[13], life-style preference[14] and mental health[15] play important roles in the rising prevalence of obesity worldwide. However, there is a paucity of recent data on thrprevalence of obesity on Wannan area adolescents. The present study aimed to assess the prevalence of overweight and obesity in Anhui secondary school adolescents.

In this study, we desired to estimate the physical health of adolescents based on two references [the International Obesity Task Force standard (IOTF) and National Center for Health Statistics (NCHS)]

Methods

Subjects and methods

Participants

A cross-sectional study was performed among 6347 students in south of Anhui, China. Then we choose 4788 students who aged from 14 to 18 years old. This study consisted of 2360 male and 2428 female was recruited in 2013. Subjects were selected through multiple-cluster sampling. All subjects agreed to provide their personal information regarding the purpose and the procedures of our study, and written informed consent. Local ethics committee also approved and supported our study.

Anthropometric measurements

Weighing of the students was done, while they had light clothes on and they were bare-footed, measured to the nearest 0.1 kg on an electronic scale. The height of each student was also measured in standard manner, allowing for an error of 0.1cm. All anthropometric data were collected by trained staff and supervised by two school nurses. Body mass index was computed using the following standard equation: BMI=Weight in kg/height squared in meter.

Definitions

Overweight and obesity are defined on BMI cut off points, which are gender and aged special. (1) The International Obesity Task Force standard are based on heath related adult definitions of overweight (≥ 25 kg/m^2) and obesity (≥ 30kg/m^2) but are adjusted to specific age and sex categories for adolescents. (2) The National Center for Health Statistics references are based on the different BMI at the age of 14-18 for classification of adolescents, respectively[16].

Ethical consideration

The questionnaire was anonymous, and the participants were assured of data confidentiality. The protocol for human research of local and international guidelines on ethics was followed.

Statistical analysis

Descriptive statistic were used to characterize the sample in different age and sex by Excel software. A line graph was draw for the prevalence of overweight/obesity among subjects by age.

Results

The anthropometric characteristics of the sample, such as the mean (±SD) of weight, height, and calculated BMI are shown in Table I. A total of 4788 participants were evaluated in this study, 2360 male and 2428 female, aged 14-18 years. The prevalence of overweight and obesity among adolescents in China is described in Table II. The IOTF standard showed the trend in the prevalence of overweight (including obesity) and obesity tended to decrease with age in male. The prevalence of overweight (including obesity) among adolescent aged 14 to 18 year decreased from 17.3% to 5.3%,and the prevalence of obesity from 3.8% to 2.3%. Depending on the NCHS references used, the overall prevalence of overweight (including obesity) and obesity in male aged 14 to18 decreases from 16.4% to 11.7% and from 4.6% to 2.8%, respectively. Using both international standards, the prevalence of overweight (including obesity) and obesity was fluctuant in female. Figure (1 y 2) showed that the overall proportion of overweight and obesity decreased as the age increased. The highest prevalence of overweight (17.3%) and obesity (4.6%) was reported at age 14.

Discussion

In the present study, we used two references [the International Obesity Task Force standard (IOTF) and National Center for Health Statistics (NCHS)], which are widely developed worldwide, to define the overweight and obesity among secondary school students. However, the prevalence of obesity and overweight was lower than that of previous study[17]. An interesting observation was that the prevalence of overweight (including obesity) and obesity have a decrease with age in male, which is similar to the research by O,Musaiger A and Al-Mannai, M[18].

Table I
Mean(±SD) of height, weight and BMI of secondary school students by age

|		14	15	16	17	18
Male	N	452	720	815	316	57
	Height(cm)	169.15±7.20	172.51±5.90	173.92±5.75	173.85±5.16	175.02±4.70
	Weight(kg)	57.42±12.42	60.03±10.95	62.24±11.06	61.62±9.92	63.00±8.82
	BMI(kg/m^2)	19.96±3.59	20.13±3.32	20.53±3.18	20.36±3.04	20.55±2.66
Female	N	405	798	831	345	49
	Height(cm)	160.80±5.83	162.10±5.41	162.13±4.81	161.89±5.10	162.47±4.34
	Weight(kg)	50.83±9.07	50.96±7.26	51.34±7.48	51.45±7.20	52.18±8.07
	BMI(kg/m^2)	19.64±3.25	19.4±2.63	19.53±2.75	19.64±2.70	19.8±3.23
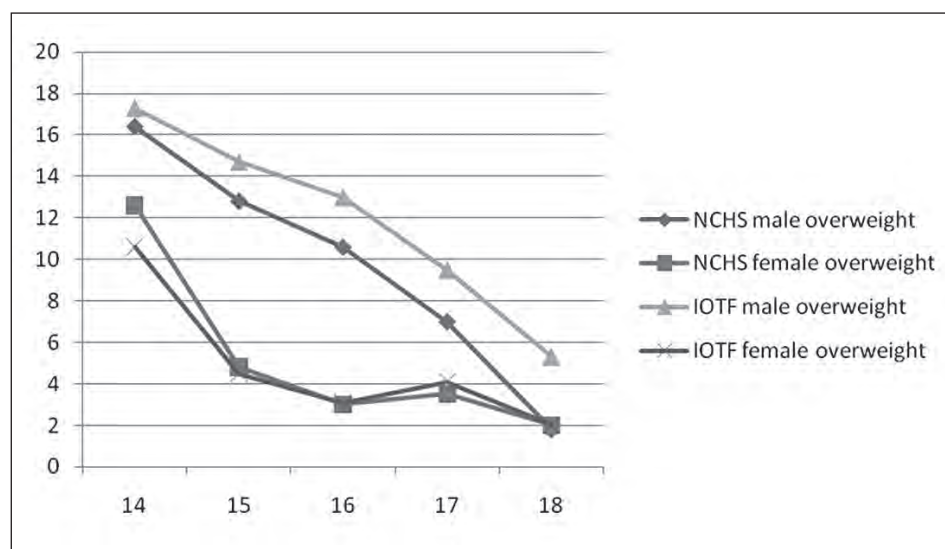
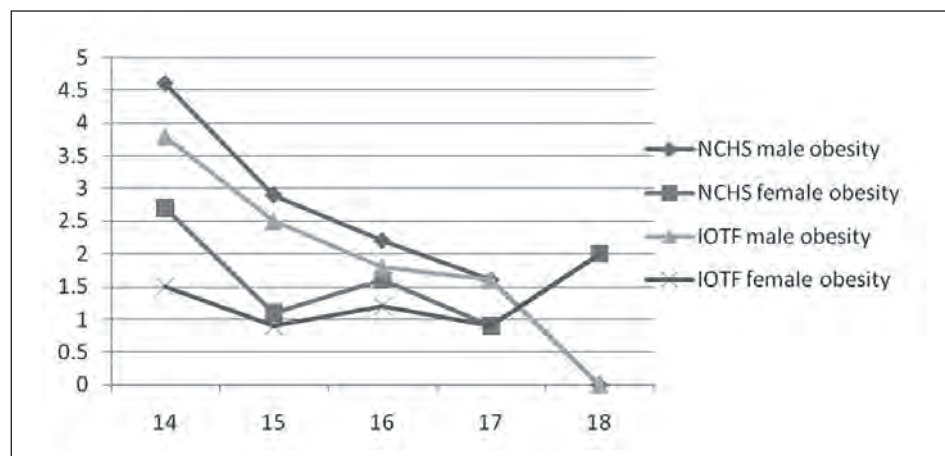*Fig. 1.—The prevalence of overweight for secondary school students by age (%).*

Fig. 2.—The prevalence of obesity for secondary school students by age (%).

Table II
Prevalence of overweight and obesity in secondary school students by sex and age

Sexual	Reference		Prevalence (%)					Total
	Age		14	15	16	17	18	
Male	N		452	720	815	316	57	2360
	Overweight	NCHS	74(16.4)	92(12.8)	86(10.6)	22(7.0)	1(1.8)	275(11.7)
	Obesity	NCHS	21(4.6)	21(2.9)	18(2.2)	5(1.6)	0(0)	62(2.8)
	Overweight	IOTF	78(17.3)	106(14.7)	106(13.0)	30(9.5)	3(5.3)	323(13.7)
	Obesity	IOTF	17(3.8)	18(2.5)	15(1.8)	5(1.6)	0(0)	55(2.3)
Female	N		405	798	831	345	49	2428
	Overweight	NCHS	51(12.6)	38(4.8)	25(3.0)	12(3.5)	1(2.0)	127(5.2)
	Obesity	NCHS	11(2.7)	9(1.1)	13(1.6)	3(0.9)	1(2.0)	37(1.5)
	Overweight	IOTF	43(10.6)	36(4.5)	26(3.1)	14(4.1)	1(2.0)	120(4.9)
	Obesity	IOTF	6(1.5)	7(0.9)	10(1.2)	3(0.9)	1(2.0)	27(1.1)

Some factors that may be associated with the increasing prevalence of obesity among children and adolescent in China have been investigated. Chen, T.J et al found that spending more hours on watching television, playing computer games and surfing the internet were significantly associated with increased risk of obesity among Chinese youth[19]. Ahn, et al.[20] reported that nutrition transition was accelerating and the result of this trend was a rapid increase in obesity and chronic diseases.

Our finding of this study is similar to those reported in Italy, which reported that the trend in the prevalence of overweight (including obesity) among girls from 9-y to 15-y-old strongly was decreasing[21]. The possible reason maybe those secondary school children have exam stress and inadequate sleep time, and unhealthy eating behavior. Thus, further investigation should be taken to confirm whether there were relationship between exam stress and overweight. Our limitation maybe that samples size in 18 year old children is little small, and lack of data of type of learning, sleep time and test anxiety scale. We should collect more information in future study.

Our study showed that a comparison between two international standards to estimate for overweight and obesity among Anhui adolescents. A suitable defining selection of reference standard, therefore, should be considered when interpreting the prevalence of obesity among school children. The findings of this study raise the need for an intervention of school program to improve the health status and life equality of Chinese children and adolescents, especially in secondary school.

Conclusions

The study shows that the trend in overall prevalence of overweight (including obesity) and obesity is decreasing, especially in male should be given more attention in China. The study suggests secondary school and government need to design appropriate guidelines to keep healthy for adolescents in China.

Acknowledgement

Conflict of Interest

None declared

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Prevalence of overweight and obesity
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