



Original/*Obesidad*

Prevalence of underweight, overweight and obesity in university students from the region of Anhui (China)

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Abstract

Background: Overweight and obesity are epidemic worldwide. Our previous study found that the prevalence of overweight and obesity in primary students is high.

Objective: we sought to estimate whether the prevalence of overweight and obesity among university students is still high in China.

Methods: A cross-sectional study was designed to collect the routine health screening data for university students in 2013. The height and weight of students were measured, and BMI was calculated with height and weight, we estimated the underweight and obesity prevalence of university students using by two references [Working Group on Obesity references in China (2004) and World Health Organization (WHO) criteria (2000)].

Results: Depending on the China references used, the overall prevalence of underweight, overweight (including obesity) and obesity in male university students were 14.2%, 14.7% and 4.2%, respectively; in female university students were 27.5%, 4.4% and 0.6%, respectively. Depending on the WHO references used, the overall prevalence of underweight, overweight (including obesity) and obesity in male university students were 14.2%, 11.5% and 2.5%, respectively, in female university students were 27.5%, 2.4% and 0.3%, respectively. An interesting observation made was that the underweight prevalence of university students has an increasing trend, especially in female.

Conclusion: The study showed that the prevalence of underweight in university students, especially in female students has become a critical health issue. Related department of school and government should pay more attention to student's physical health.

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PREVALENCIA DE BAJO PESO, EL SOBREPESO Y LA OBESIDAD EN ESTUDIANTES UNIVERSITARIOS DE LA REGIÓN DE ANHUI (CHINA)

Resumen

Antecedentes: El sobrepeso y la obesidad son epidemia en todo el mundo. Nuestro estudio anterior halló que la prevalencia de sobrepeso y obesidad en estudiantes de primaria es alto.

Objetivo: Hemos tratado de estimar si la prevalencia del sobrepeso y la obesidad entre los estudiantes universitarios es todavía alta en China.

Métodos: Un estudio transversal fue diseñado para recoger los exámenes de salud de rutina datos para estudiantes universitarios en 2013. La altura y el peso de los estudiantes fueron medidos, y el IMC se calcula con la altura y el peso, así como para estimar la prevalencia de insuficiencia ponderal y obesidad de la Universidad los estudiantes utilizando dos referencias [Grupo de trabajo sobre la obesidad referencias en China (2004) y la Organización Mundial de la salud (OMS) criterios (2000)].

Resultados: Dependiendo de la China referencias utilizadas, la prevalencia global de bajo peso, sobrepeso (obesidad) y la obesidad en estudiantes universitarios masculinos fueron 14,2%, el 14,7% y 4,2%, respectivamente; en mujeres estudiantes universitarios fueron el 27,5%, 4,4% y 0,6%, respectivamente. Dependiendo de los que referencias utilizadas, la prevalencia global de bajo peso, sobrepeso (obesidad) y la obesidad en estudiantes universitarios masculinos fueron 14,2%, 11,5% y 2,5%, respectivamente, en mujeres estudiantes universitarios fueron el 27,5%, 2,4% y 0,3%, respectivamente. Una observación interesante es que la prevalencia de insuficiencia ponderal de los estudiantes universitarios tiene una tendencia al aumento, sobre todo en mujeres.

Conclusión: El estudio demostró que la prevalencia de la insuficiencia ponderal en estudiantes universitarios, especialmente en mujeres estudiantes se ha convertido en un problema de salud crítico. Related Departamento de la escuela y el Gobierno deben prestar más atención a la salud física del alumno.

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Palabras clave: *Bajo peso. Obesidad. Estudiantes universitarios.*

Introduction

Increasing number of reported that a high prevalence of obesity and overweight is common in developing countries undergoing nutritional transition¹⁻⁶. These are also a major emerging public health problem in China⁷. Thinness is an important overlooked phenomenon with wide variation in prevalence and trends across developed countries⁸. Some researcher found that the prevalence of underweight in university students is high⁹. Olearo B et al¹⁰ reported that 12, 5% university students are underweight. A random sample of university students from 22 universities in 22 low, middle income and emerging economy countries also revealed that the prevalence of underweight among women students was 17.6%¹¹. A study conducted in Malaysia reveals that 14.8% medical students were underweight (males 12.2% and females 17.0%)¹². Thus, underweight prevalence among university students also arouses our special attention.

In this study, we sought to evaluate the physical health of university students based on two references [Working Group on Obesity references in China (2004) and World Health Organization (WHO) criteria (2000)].

Subjects and methods

Participants

A school-based cross-sectional study was conducted in a university student who admitted routine health screening in 2013. This study contains a total of 2617 subjects (1131 male and 1486 female) was recruited in 2013, aged 19-23 years. All subjects agreed to provide their personal information regarding the purpose and the procedures of our study, and written informed consent. This study was approved by local ethics committee.

Anthropometric measurements

Height was measured to the nearest 0.1 cm with a standard stadiometer following study protocols, and weight in kilograms was measured in light clothing to the nearest 0.1 kg on an electronic scales. All anthropometric data were collected by trained staff and supervised by the school nurse. BMI was computed using the following standard equation: BMI = Weight in kg/height squared in meter.

Definitions

Overweight and obesity were defined on BMI cutoff points, which are gender and age specific. (1) Working Group on Obesity references in China, the BMI cutoff points are 24 and 28 for overweight and obesity, respectively; (2) the WHO reference is based on the BMI of 25 and 30 at the age of 18 for classification of childhood and adolescent overweight and obesity, respectively.

Statistical analysis

Excel software was performed to describe the prevalence of overweight/obesity among university students. A line graph was draw for the prevalence of overweight and obesity among university students by age.

Results

In this study, a total of 2617 subjects (1131 male and 1486 female) was recruited in 2013, aged 19-23 years. The mean values (\pm SD) of weight, height, and calculated BMI are shown in table I.

Table I
Mean (\pm SD) of height, weight and BMI of university students by age

	19	20	21	22	23
Male					
n	80	354	404	219	74
Height (m)	1.74 \pm 0.04	1.74 \pm 0.05	1.73 \pm 0.06	1.73 \pm 0.06	1.73 \pm 0.05
Weight (kg)	62.88 \pm 8.27	66.12 \pm 11.32	63.87 \pm 9.62	63.61 \pm 9.71	62.36 \pm 8.78
BMI (kg/m ²)	20.69	21.92	21.36	21.27	20.88
Female					
n	109	457	547	285	90
Height (m)	1.62 \pm 0.06	1.62 \pm 0.05	1.62 \pm 0.05	1.62 \pm 0.05	1.62 \pm 0.05
Weight (kg)	52.95 \pm 7.40	53.70 \pm 24.50	52.04 \pm 6.59	53.11 \pm 25.51	51.86 \pm 6.69
BMI (kg/m ²)	20.10	20.49	19.92	20.32	19.81

The prevalence of underweight, overweight and obesity for university students are shown in table II. Depending on the China references used, the overall prevalence of underweight, overweight (including obesity) and obesity in male university students were 14.2%, 14.7% and 4.2%, respectively; in female university students were 27.5%, 4.4% and 0.6%, respectively. Depending on the WHO references used, the overall prevalence of underweight, overweight (including obesity) and obesity in male university students were 14.2%, 11.5% and 2.5%, respectively, in female university students were 27.5%, 2.4% and 0.3%, respectively. Change of underweight, overweight and obesity prevalence are showed (Figs. 1-3). An interesting observation made was that the underweight prevalence of university students has an increase trend, especially in female. (Fig. 1).

Discussion

In the present study, we use two references [Working Group on Obesity references in China (2004) and World Health Organization (WHO) criteria (2000)] to evaluate the overweight and obesity

among university students. The results based on China reference revealed that the overall prevalence of underweight, overweight (including obesity) and obesity in male university students were 14.2%, 14.7% and 4.2%, respectively; in female university students were 27.5%, 4.4% and 0.6%, respectively. Depending on the WHO references used, the overall prevalence of underweight, overweight (including obesity) and obesity in male university students were 14.2%, 11.5% and 2.5%, respectively, in female university students were 27.5%, 2.4% and 0.3%, respectively. The prevalence of underweight is similarly with the previous study¹³. An interesting observation made was that the prevalence of underweight was increase with age.

Previous study documented that the prevalence of thinness was higher than the prevalence of overweight and obesity, especially in students from high status families¹⁴. The possible reason maybe that university students have unhealthy eating behavior and inadequate nutrient intake, and a high prevalence of underweight among university students¹⁵. Thus, further investigation should be taken to confirm that whether there are a relationship between eating habits and underweight.

Table II
The prevalence of obesity for university students according to age

		reference	Prevalence (%)					Total
Age (years)			19	20	21	22	23	
Male	n		80	354	404	219	74	1131
	underweight	China ^{##}	14 (17.5)	46 (13.0)	55 (13.6)	30 (13.7)	16 (21.9)	161 (14.2)
	Normal	China ^{##}	58 (72.5)	238 (67.2)	280 (69.3)	153 (69.9)	48 (65.8)	777 (68.8)
	Overweight ^a	China ^{##}	7 (8.8)	46 (13.0)	58 (14.4)	26 (11.9)	7 (9.6)	144 (12.7)
	Obesity	China ^{##}	1 (1.3)	24 (6.8)	11 (2.7)	10 (4.6)	2 (2.7)	48 (4.2)
	underweight	WHO [#]	14 (17.5)	46 (13.0)	55 (13.6)	30 (13.7)	16 (21.6)	161 (14.2)
	Normal	WHO [#]	60 (75)	258 (72.9)	305 (75.5)	164 (74.9)	53 (71.6)	840 (74.3)
	Overweight ^a	WHO [#]	6 (7.5)	32 (9.0)	37 (9.2)	22 (10.0)	5 (6.8)	130 (11.5)
	Obesity	WHO [#]	0 (0.0)	18 (5.1)	7 (1.7)	3 (1.4)	0 (0.0)	28 (2.5)
Female	n		109	457	547	285	90	1486
	underweight	China ^{##}	29 (26.6)	120 (26.3)	155 (28.3)	76 (26.7)	29 (32.2)	409 (27.5)
	Normal	China ^{##}	70 (64.2)	309 (67.8)	369 (67.5)	199 (69.8)	57 (63.3)	1004 (67.5)
	Overweight ^a	China ^{##}	9 (8.3)	22 (4.8)	21 (3.8)	9 (3.2)	4 (4.4)	65 (4.4)
	Obesity	China ^{##}	1 (0.9)	5 (1.1)	2 (0.4)	1 (0.4)	0 (0.0)	9 (0.6)
	underweight	WHO [#]	29 (26.6)	120 (26.3)	155 (28.3)	76 (26.7)	29 (32.6)	409 (27.5)
	Normal	WHO [#]	74 (67.9)	319 (70)	378 (69.1)	206 (72.3)	60 (67.4)	1037 (69.8)
	Overweight ^a	WHO [#]	6 (5.5)	14 (3.1)	13 (2.4)	2 (0.7)	0 (0.0)	35 (2.4)
	Obesity	WHO [#]	0 (0.0)	3 (0.7)	1 (0.2)	1 (0.4)	0 (0.0)	5 (0.3)

^{##} Working Group on Obesity references in China. [#] The WHO reference. Overweight^a: Overweight including obesity.

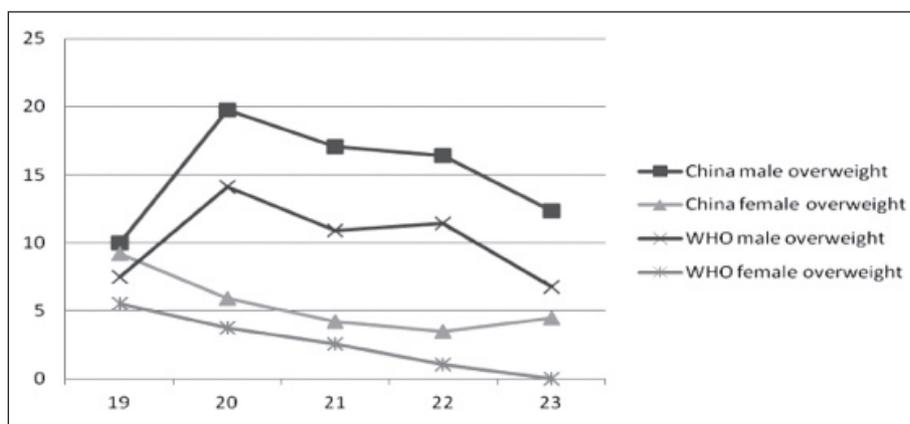


Fig. 1—The prevalence of overweight for university students by age(%).

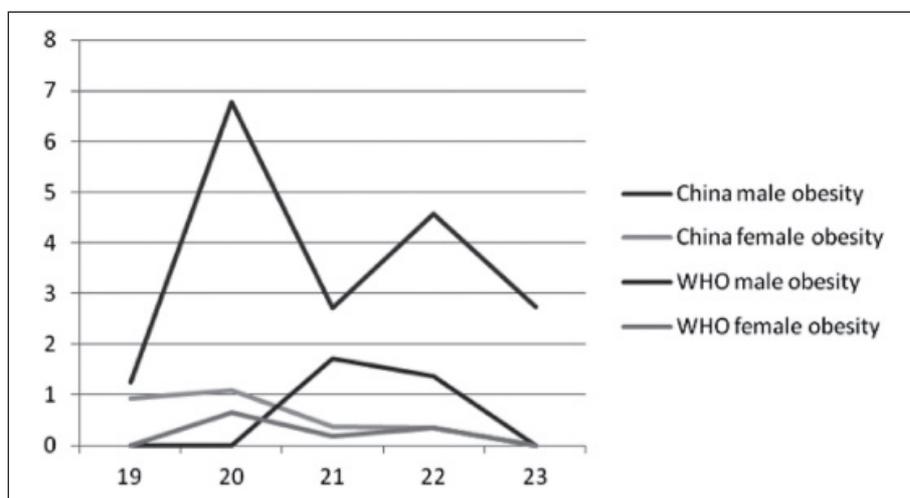


Fig. 2—The prevalence of obesity for university students by age(%).

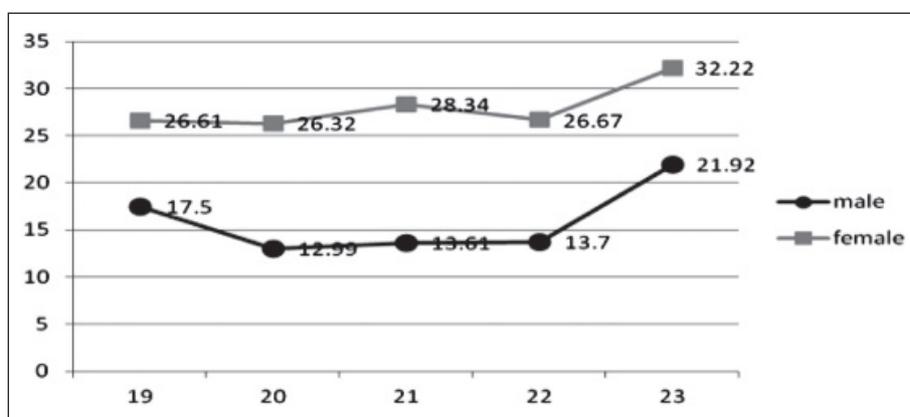


Fig. 3—The prevalence of underweight for university students by age(%).

Conclusions

The study showed that the prevalence of underweight in university students, especially in female students has become a critical health issue. Related department of school and government should pay more attention to student's physical health.

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Conflict of interest

None declared.

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