

Commentary



Tackling Adult Obesity in China: A Time for Action

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With rapid urbanization and economic development, obesity has emerged as a major public health concern in China. According to the latest Global Burden of Diseases study, there were 402 million overweight and obese Chinese adults in 2021 and this number is projected to further increase to 627 million by 2050^[1]. Obesity is closely associated with an elevated risk of type 2 diabetes, cardiovascular and cerebrovascular diseases, depression, and certain cancers^[2,3]. In addition to being a risk factor, excess adiposity can directly damage end-organs and affect the ability to conduct daily activities^[4]. In this perspective, we aim to provide an overview of the epidemiology of obesity among Chinese adults based on the China Chronic Disease and Risk Factor Surveillance (CCDRFS) and summarize the related determinants and health policies against obesity.

Over the past two decades, a gradual increase in body mass index (BMI) has been observed in Chinese adults. According to the results from the CCDRFS, the BMI increased from 22.7 kg/m² in 2004 to 24.4 kg/m² in 2018 (an annual increase of 0.12 kg/m²) among people aged 18–69 years^[5]. Based on Chinese criteria, the corresponding prevalence of obesity was 7.1% in 2004 and 16.8% in 2018 (an annual relative increase of 6.3%). In terms of differences across subpopulations, the prevalence of obesity generally increased with age, with the exception of a moderate reduction in late adulthood. Specifically, the prevalence of obesity peaks at 40–49 years in men and at 50–59 years in women^[6]. Although women had a higher BMI, compared with men, in 2004 (22.9 vs. 22.5 kg/m², respectively), this pattern was reversed in 2018 (24.1 vs. 24.7 kg/m² in women and men, respectively)^[5]. Similarly, the prevalence of obesity among women was higher in 2004 (8.2% vs. 6.1%) but lower in 2018 (14.8% vs. 18.8%), compared with that among men. A distinct pattern of association of obesity with urban-rural residence and sex was found, with a higher prevalence in rural

women and urban men^[5]. When further examined at the provincial level, clusters of high obesity prevalence were observed in the Beijing-Tianjin-Hebei metropolitan area, Liaoning, and Inner Mongolia^[7]. Despite being routinely used in epidemiological studies, BMI does not consider fat distribution in the body. Consequently, a recently released consensus urged the use of additional anthropometric measures, such as waist circumference (WC) or waist-to-height ratio^[4]. Using WC ≥ 90 cm in men and ≥ 85 cm in women as cutoffs, the prevalence of abdominal obesity was 35.2% among Chinese adults in 2018, with higher prevalence noted in men versus women (37.2% vs. 33.3%)^[6]. Although the prevalence of abdominal obesity was the highest among men aged 45–59 years, it increased with age throughout adulthood in women. Similar to general obesity, abdominal obesity was more common in urban men, rural women, and residents of the Beijing-Tianjin-Hebei metropolitan area^[6,7].

Considering that obesity results from an imbalance between energy intake and expenditure, diet and physical activity are crucial modifiable factors. China is undergoing a nutritional transition from a traditional diet, mainly comprising grains and vegetables, to a more westernized diet with higher animal calories and processed food. Meanwhile, mechanization in the workplace and the ubiquitous use of modern vehicles have led to prolonged sedentary behavior among Chinese people. Consequently, the prevalence of excessive red meat intake increased from 27.4% in 2010 to 42.0% in 2018, accompanied by increases in insufficient physical activity (from 17.9% to 22.3%) and leisure sedentary time (from 2.7 to 3.2 h/d)^[6,8,9]. Relevant association studies demonstrated that a westernized diet (odds ratio [OR] = 1.57)^[10], including ultra-processed food (OR = 1.45) and sugar-sweetened beverages (OR = 1.86)^[11,12] was a significant risk factor for overweight or obesity. Although

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occupational ($OR = 0.75$) and leisure physical activity ($\beta = -0.15$) were associated with lower overweight or obesity risk or BMI^[13,14], sedentary time ($\beta = 0.19$) showed the reverse trend^[14]. In addition, shorter sleep duration ($OR = 1.15$) and mental disorders, such as depression ($OR = 1.27$), were associated with a higher risk of weight gain or abdominal obesity^[15,16]. Indeed, all aforementioned individual-level determinants are largely shaped by the environment. Among the environmental factors, those associated with a higher risk of obesity included higher restaurant density ($OR = 1.28$)^[17], presence of light at night ($OR = 1.27$)^[18], exposure to phthalates ($OR = 1.77$)^[19] and bisphenols ($OR = 1.83$)^[20], and lower residential greenness ($OR = 2.02$) (Table 1)^[21].

As the obesity burden will continue to increase in China and as it is affected by multilevel determinants, a conventional individual-centered preventive strategy is insufficient, and a government-led national initiative is urgently needed. In this context, the National Health Commission and 15 other Chinese departments jointly launched a 3-year campaign on weight management in June 2024^[22]. To facilitate the implementation of this national initiative, we

propose the following recommendations: First, taxes should be imposed on unhealthy food and food-labeling regulations should be enforced. Existing evidence indicates that sweetened beverage taxes and warning labels for ultra-processed foods dramatically decrease their purchase^[23,24]. This success has profound implications for battling obesity and may also apply to takeaway food in China. Additionally, reducing the price of healthy foods is another approach to increase people's healthy food options. Second, public literacy regarding the risk and management of obesity should be increased. Recognizing the importance of professional knowledge is a prerequisite for improving the awareness of obesity. The knowledge used for sharing should be not only easily understood but should also be translated into actionable measures, e.g., "Three Reduction, Three Healthy Conditions". Knowledge dissemination can be integrated with social media, public transportation, and regular healthcare to expand its impact. Third, a strategic framework tailored to various scenarios should be developed. At the family level, nutritional education should be enhanced, targeting those who cook at home. At the community level, the construction of a physical

Table 1. Individual- and macro-level determinants of obesity among Chinese adults

Determinants	Exposure contrast	Outcome	Effect (95% CI)
At individual level			
Westernized diet	Top vs bottom quintile of westernized dietary pattern	BMI ≥ 25 kg/m ²	1.57 (1.26, 1.95)
Ultra-processed food	≥ 50 g/d vs. non-consumers	BMI ≥ 25 kg/m ²	1.45 (1.21, 1.74)
Sugar-sweetened beverage	≥ 2 units vs. < 2 unit	BMI ≥ 27.5 kg/m ² or WC ≥ 80 cm	1.86 (1.36, 2.55)
Occupational physical activity	Heavy vs. light	BMI ≥ 24 kg/m ²	0.75 (0.65, 0.86)
Leisure physical activity	Per 14 MET-h/d	BMI	-0.15 (-0.16, -0.14)
Sedentary behavior	Per 1.5 h/d	BMI	0.19 (0.18, 0.20)
Sleep duration	≤ 6 h vs. 7–7.9 h	Weight gain ≥ 5 kg	1.15 (1.02, 1.29)
Depression	Mild or advanced vs. minimal	WC ≥ 90 cm (men) or 85 cm (women)	1.27 (1.01, 1.62)
At macro level			
Restaurant density	$> 0.29/\text{km}^2$ vs. none	BMI ≥ 28 kg/m ²	1.28 (1.07, 1.53)
Residential greenness	Bottom vs. top quartile of NDVI _{500-m}	BMI ≥ 28 kg/m ²	2.02 (1.33, 3.08)
Artificial light at night	Top vs. bottom quartile of LAN _{1000-m}	BMI ≥ 28 kg/m ²	1.27 (1.12, 1.43)
Phthalates	Top vs. bottom quartile of MEOHP	BMI ≥ 28 kg/m ²	1.77 (1.19, 2.62)
Bisphenols	Top vs. bottom tertile of BPA	WC ≥ 90 cm (men) or 80 cm (women)	1.83 (1.09, 3.08)

Note. BMI, body mass index; WC, waist circumference; MET, metabolic equivalent task; NDVI, normalized difference vegetation index; LAN, light at night; MEOHP, mono (2-ethyl-5-oxohexyl) phthalate; BPA, bisphenol A.

activity-supporting environment should be reinforced and intervention tools, such as salt control spoons and oil control pots, must be distributed to families. At the workplace level, intervention programs (e.g., brisk walking ten thousand steps per day) should be implemented and annual health examinations should be ensured. At the medical institutional level, weight management clinics should be established to manage patients with severe obesity. For older adults, it is fundamental for healthcare providers to distinguish reduced weight related to a healthy lifestyle from that caused by preexisting diseases. Fourth, new technologies should be incorporated into routine weight management. Emerging wearable devices and smartphone applications can provide timely feedback on physical activity and energy consumption, which is in favor of personalized intervention and sustained behavioral changes. Finally, periodic national weight surveillance should be conducted at the district/county level. Continuous health monitoring will enable the refinement of policies and resource allocation, thereby attenuating inequalities in obesity. Notably, overemphasis on individual responsibility and overmedicalization as a consequence of conflicts of interest must be avoided when implementing the proposed recommendations.

With all Chinese adults involved in the year of weight management, we expect better consciousness of weight control and supporting environments in the following years, alongside evidence-based interventions, which will ultimately contribute to curbing of rising trend of obesity and the goals of “Healthy China 2030”.

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