Proceedings of ICBioMed 2025 Symposium: AI for Healthcare: Advanced Medical Data Analytics and Smart Rehabilitation
DOI: 10.54254/2753-8818/2025.AU25934

The Problem of Obesity in China and Its Public Health Response Strategy

Xinzheng Cao

College of Health Management, Anhui Medical University, Hefei, China
2213045013@stu.ahmu.edu.cn

Abstract. Obesity has become a major public health issue globally, including in China. Its prevalence has increased rapidly in recent years, resulting in severe health and socioeconomic consequences. Current research indicates that urbanization, lifestyle changes, and socioeconomic factors are key drivers of the obesity epidemic in China. However, significant urban-rural disparities and insufficient interdepartmental collaboration hinder the implementation of existing intervention measures, limiting the effectiveness of obesity prevention and control efforts. This paper systematically analyzes the current status of obesity in China, the public health response measures implemented, and the outcomes of their implementation. Specifically, it examines national action plans, community and school interventions, healthcare system reforms, and the application of digital health management tools. The study emphasizes the importance of interdepartmental coordination, multi-channel public health education, and balanced resource allocation between urban and rural areas to enhance the effectiveness of obesity prevention and control efforts. Future research should focus on these areas to improve the effectiveness of intervention measures.

Keywords: Obesity in China, Obesity prevention, Health policy, Health disparities.

1. Introduction

Obesity is defined as a chronic, multifactorial disease characterized by excessive fat accumulation, which poses significant health risks. Its prevalence has escalated on a global scale, affecting 1.9 billion adults and 340 million children and adolescents as of 2022 [1]. The World Health Organization has formally designated it as a global epidemic; however, existing population-based interventions have thus far proven ineffective in curbing its rise. Currently, China has the largest population of overweight and obese individuals in the world [2]. Furthermore, China's rates of overweight and obesity have been increasing since the 1990s. Public health is the science of protecting and improving the health of people and their communities. The prevalence of obesity in China is increasingly being recognized as a major public health concern.

In 2019, overweight and obesity accounted for 11.1% of non-communicable disease (NCDs)-related deaths, marking a substantial increase from 5.7% in 1990 [3]. This situation has precipitated a substantial escalation in national health expenditures for the management of NCDs. The public health ramifications of obesity encompass a multitude of consequences, including but not limited to direct and indirect economic expenditures, diminished life expectancy, and deteriorated quality of

DOI: 10.54254/2753-8818/2025.AU25934

life. This phenomenon also gives rise to a multitude of complications. Obesity has been demonstrated to be associated with 21 distinct disorders, encompassing the domains of the digestive system, respiration, cardio metabolism, infectious diseases, musculoskeletal system, and neurological system [4]. In the terms of infections, obesity has been identified as a risk and recurrence factor. These infections can manifest in various forms, including surgical site infections, respiratory infections, cutaneous infections, and urinary infections. Obesity is often associated with more severe disease and mortality [5]. However, in China, obesity itself is not usually considered a disease unless it is accompanied by serious complications, such as type 2 diabetes [6].

Obesity is a manageable risk factor for chronic, noncommunicable diseases, as well as a measurable and actionable goal in national health policy. Preventing and controlling obesity is one of the key areas in China's efforts to achieve the United Nations' Sustainable Development Goals [7]. According to the latest research, over 50% of Chinese adults and nearly 20% of school-age children are overweight or obese [8]. Obesity has exacerbated the decline in fertility rates, which seriously affects healthy aging and poses a major challenge to China's sustainable population development [9]. The growth of NCDs in China is alarming. According to the latest Global Burden of Disease study, NCDs are the leading causes of death and disability-adjusted life years (DALYs) in the Chinese population [10]. The most critical risk factors are tobacco use, particulate matter pollution, high fasting glucose, and high sodium intake (leading causes of death), as well as high body mass index (leading cause of DALYs). Therefore, controlling NCDs and their risk factors is essential for improving the nation's health. In the face of the serious obesity epidemic, China has implemented national policies and plans to promote healthy lifestyles and prevent NCDs. Although China has made significant progress in developing a national strategy for the prevention and control of NCDs, it still faces many challenges. For example, there is insufficient emphasis on evidence-based approaches in the development of policies, strategies and practices for the prevention, diagnosis, treatment and management of NCDs. This has resulted in poor adherence to NCD policies [7].

The purpose of this review is to explore the current obesity problem in China and how to strengthen the collaboration between public health and healthcare initiatives to more deeply influence the current obesity situation in China and further improve the accessibility of healthcare services.

2. Analysis of the obesity problem in China

In recent decades, China has experienced a significant epidemiological shift characterized by an increasing prevalence of NCDs, with obesity playing a central role. Once considered an issue exclusive to high-income countries, obesity has become increasingly prevalent in China due to rapid urbanization, economic growth and changes in dietary and physical activity patterns [11]. According to data from the Chinese Center for Disease Control and Prevention, the adult obesity rate in China reached approximately 50% in 2024, with childhood obesity also increasing at an alarming rate [12].

China's dietary habits and lifestyle have significantly changed due to urbanization, leading to a marked increase in obesity rates. From 1991 to 2006, research indicates that urbanization resulted in a reduction of 500 to 600 kilocalories in daily energy expenditure [11]. This reduction was primarily due to decreased physical activity and an increased reliance on motorized transportation instead of walking or cycling. Sedentary behavior has become widespread, even in rural areas. A study in Zhejiang Province found that more than half (54.6%) of adults spend over four hours per day sitting. Meanwhile, dietary patterns have shifted rapidly toward high-energy-density foods, high-fat intake, and heavy reliance on processed foods. Data from the China Health and Nutrition Survey (CHNS)

DOI: 10.54254/2753-8818/2025.AU25934

show that fat accounts for 36.8% of daily calorie intake among children aged six to seventeen, and this proportion increases with rising income and urbanization levels [11]. This dietary shift is partly due to aggressive marketing of processed foods and easy access to high-energy processed foods. These factors are key drivers of the obesity epidemic directly linked to China's ongoing urbanization process.

China's socioeconomic disparities are increasingly shaping obesity patterns through intertwined cognitive, behavioral, and cultural pathways. Between 1985 and 2019, the prevalence of overweight or obesity among children and adolescents aged 7 to 18 rose from approximately 5.3% to over 24% [11]. Projections indicate that obesity rates in rural areas will equal or exceed those in urban areas by around 2027, suggesting a reversal in the obesity burden between rural and urban areas. This shift has a particularly significant impact on low-income and rural households: the lack of access to nutritious food, recreational spaces, and health education makes high-calorie, low-nutrient diets (typically consisting of fast food and processed snacks) a practical yet unhealthy choice. Epidemiological evidence also suggests that modern dietary patterns, including traditional northern diets, are associated with significantly higher obesity risks compared to more balanced plant-based diets. Meanwhile, the prevalence of central obesity among rural adults has risen to levels comparable to or even higher than those in urban areas, reflecting inequalities in resource allocation. These structural factors are further exacerbated by cultural perceptions: in many regions, being overweight is not viewed as unhealthy, which undermines public awareness of associated health risks and hinders prevention efforts. These socioeconomic, environmental, and cultural dynamics collectively constitute the powerful and complex drivers of China’s obesity epidemic.

The health consequences of obesity are significant. It is a significant risk factor for type 2 diabetes, cardiovascular disease, hypertension, certain cancers and musculoskeletal disorders. With more than 118 million people living with diabetes, China has the world's largest diabetes population, accounting for approximately 22% of all cases worldwide [13]. Moreover, obesity imposes a heavy economic burden on the healthcare system, both in terms of direct medical costs and indirect costs due to reduced productivity and premature mortality.

3. Strategies for addressing obesity in China

.It is evident that the Chinese government is cognizant of the mounting menace posed by the prevalence of obesity and its associated NCDs. In light of this, the government has initiated a series of public health initiatives with the objective of addressing this issue. A fundamental strategy underpinning this initiative is the implementation of the "Healthy China 2030" plan, which places significant emphasis on the implementation of prevention-oriented health policies, the enhancement of health literacy, and the promotion of healthy lifestyles [7].

3.1. Public awareness and education campaigns

The government recognizes health education as a pivotal instrument for behavioral change and has launched nationwide campaigns to enhance public understanding of the dangers of unhealthy diets and sedentary lifestyles. The "National Nutrition Plan (2017–2030)" emphasizes balanced eating and advocates for clear nutrition labeling on packaged foods [7]. This includes mandatory front-of-package labels that highlight the sugar, salt, and fat content. Public campaigns like the 2019 initiative "Healthy China Action" use multi-channel mass media, including TV, radio, and social media platforms, to widely disseminate nutritional knowledge. Evaluation studies have shown an increase in public knowledge of nutrition and physical activity recommendations [8]. For instance,

DOI: 10.54254/2753-8818/2025.AU25934

consumer surveys conducted after the implementation of these campaigns revealed greater awareness of the health consequences of consuming sugar-sweetened beverages and processed foods, suggesting improved dietary choices among the target populations.

3.2. School and community interventions

Due to the rising prevalence of childhood obesity, schools have become central venues for intervention efforts. These efforts include policies such as mandatory physical education classes with structured curricula and regular BMI monitoring to track student health. The “Sunshine Sports Project” initiative mandates a minimum daily duration of physical activity in schools [14]. Additionally, local governments have restricted the sale of high-calorie snacks in school cafeterias and substituted them with healthier alternatives. Community-based initiatives complement these measures by developing infrastructure such as urban parks, walking paths, and recreational sports facilities [7]. For instance, Shenzhen’s “Healthy City Program” has measurably increased physical activity levels among children and adolescents. Studies evaluating these interventions have reported reductions in childhood obesity prevalence rates, demonstrating their effectiveness in urban environments [15].

3.3. Regulatory and fiscal measures

In order to address the environmental determinants of obesity, regulatory strategies such as taxes on sugar-sweetened beverages (SSBs) and nutritional standards for processed foods have been explored more frequently. Although a nationwide SSB tax has not yet been implemented, pilot programs in regions such as Shanghai and Beijing have demonstrated significant reductions in SSB consumption following price increases due to taxation. Additionally, the Food Safety Law has introduced standards regulating processed food ingredients and portion sizes, stipulating clear guidelines for sugar, salt, and fat content in packaged foods. Evaluations indicate that these measures effectively encourage healthier food production and consumption. Consumers in affected areas have demonstrated reduced purchases of high-calorie processed foods and beverages [7].

3.4. Healthcare system reform

Integrating obesity prevention into primary healthcare represents another critical strategy. General practitioners across the country are increasingly required to include dietary counseling and weight management as routine healthcare services, facilitated by national guidelines such as the Chinese Guidelines for the Management of Overweight and Obesity. Digital health tools, notably mobile apps and wearable technology, have gained popularity, particularly in urban areas. Applications such as “Keep” and “Joyrun” provide users with real-time monitoring of dietary intake, physical activity, and body metrics. Studies examining these digital interventions reveal positive outcomes, including weight loss and improved engagement in physical activity. For example, urban hospitals in Hangzhou have documented improvements in patient adherence to weight management programs due to digital health integrations.

4. Challenges and obstacles

Despite the progress that has been made, a number of challenges persist in limiting the effectiveness of China's obesity control policies. There is insufficient coordination across sectors such as education, transportation, agriculture, and media. A health-in-policy approach is necessary for the

DOI: 10.54254/2753-8818/2025.AU25934

strategy to be truly effective. This approach involves the integration of health considerations into all aspects of public policy.

Secondly, There is a discrepancy in the implementation process between urban and rural regions [14]. Urban areas often have greater resources and infrastructure for health promotion, whereas rural populations may lack access to physical activity facilities, healthcare services, or even basic nutrition education. Consequently, there is a necessity for bespoke interventions to address the urban-rural disparity and to ensure that access to health-promoting resources is equitable.

Many current interventions are focused on individual behavior change rather than addressing the structural and commercial determinants of obesity. For example, the food and beverage industry continues to heavily market ultra-processed foods, often to children, through both traditional and digital media platforms [11]. Stronger regulatory oversight and advertising restrictions are essential to counter these influences and shift the food environment toward healthier options.

The shortage of primary healthcare resources and the insufficient number and capacity of professional medical personnel make it difficult to meet the needs of the large obese population, thereby affecting the effectiveness of intervention measures [6]. Coordination and cooperation between public health departments and clinical medical services is still inadequate, making it difficult to achieve a seamless transition from prevention to treatment, which affects the overall effectiveness of obesity management.

5. Opportunities and recommendations

Obesity prevention and control involves not only the health sector but also close cooperation and coordination among all relevant sectors. In light of the current opportunities and challenges in obesity prevention and control in China, this paper offers the following recommendations:

1)Strengthen collaboration among multiple sectors, including health, education, agriculture, transportation, media, and commerce, to implement the Health in All Policies (HiAP) approach and ensure that public health objectives are integrated into all policy areas.

2)Through school education and media campaigns, continuously raise public awareness of the risks of obesity, promote healthy diets and active lifestyles, and prioritize educational interventions targeting adolescents and their families.

3)Strengthen early screening and intervention mechanisms for obesity within primary healthcare services, particularly focusing on regular health check-ups for children, adolescents, and high-risk populations, and provide timely intervention services.

4)Encourage the development and promotion of digital health tools such as health management apps and wearable health devices to help the public achieve self-monitoring and management of their weight, particularly in urban areas where there is strong potential for application.

5)Promote strict regulatory measures in the food and beverage industry, particularly restricting unhealthy food advertising targeting children; consider implementing a tax on sugary beverages nationwide and establishing stricter nutritional labeling standards.

6. Conclusion

This paper provides a comprehensive analysis of the current state of obesity in China and the corresponding public health response strategies. The study shows that the prevalence of obesity in China is rising rapidly, posing a significant threat to public health and increasing the economic burden of chronic diseases. A systematic review of existing policies and interventions reveals that China has had some success promoting healthy lifestyles and strengthening obesity prevention,

DOI: 10.54254/2753-8818/2025.AU25934

especially through the "Healthy China 2030" action plan, community and school health promotion activities, and healthcare system reform.

The results of the analysis provide clear direction for future research. It is recommended that subsequent studies further explore ways to address urban-rural disparities and enhance policy implementation coordination. Additionally, this study was limited by secondary data, which prevented an in-depth analysis of specific implementation barriers at the individual and community levels. Future studies should strengthen field research and case analysis to develop more targeted intervention strategies.

References

[1] World Health Organization. Obesity. https: //www.who.int/health-topics/obesity
[2] Mu, L., Liu, J., Zhou, G., Wu, C., Chen, B., Lu, Y., Lu, J., Yan, X., Zhu, Z., Nasir, K., Spatz, E. S., Krumholz, H. M., & Zheng, X. (2021). Obesity Prevalence and Risks Among Chinese Adults: Findings From the China PEACE Million Persons Project, 2014-2018. Circulation. Cardiovascular quality and outcomes, 14(6), e007292.
[3] Linghu E. (2022). Obesity and chronic diarrhea: a new syndrome?. Chinese medical journal, 135(15), 1806–1807.
[4] Kivimäki, M., Strandberg, T., Pentti, J., Nyberg, S. T., Frank, P., Jokela, M., Ervasti, J., Suominen, S. B., Vahtera, J., Sipilä, P. N., Lindbohm, J. V., & Ferrie, J. E. (2022). Body-mass index and risk of obesity-related complex multimorbidity: an observational multicohort study. The lancet. Diabetes & endocrinology, 10(4), 253–263.
[5] Pugliese, G., Liccardi, A., Graziadio, C. et al. Obesity and infectious diseases: pathophysiology and epidemiology of a double pandemic condition. Int J Obes 46, 449–465 (2022).
[6] Zeng, Q., Li, N., Pan, X., Chen, L., & Pan, A. (2021). Clinical management and treatment of obesity in China. The Lancet Diabetes & Endocrinology, 9(6), 393–405.
[7] Lv, J., & Zhang, Z. (2024). Progress and challenges in NCD prevention and control in China. BMJ, q2098.
[8] Sun, X., Sun, Z., Peng, W., Zhang, J., Gou, B., Tian, X., Yang, Y., Wang, Y., & Group, E. A. (2024). Expert Consensus and call on actions for weight management in China: Advancing Healthy China Initiative through Strategic Actions. Deleted Journal, 6(51), 1347–1353.
[9] Zhang, Y., Gu, D., Xie, Y., & Li, B. (2024). Association between BMI and increased time-to-pregnancy in planned pregnancy couples: a cohort study in Guangzhou, China. BMC Public Health, 24(1).
[10] Zhou, M., Wang, H., Zeng, X., Yin, P., Zhu, J., Chen, W., Li, X., Wang, L., Wang, L., Liu, Y., Liu, J., Zhang, M., Qi, J., Yu, S., Afshin, A., Gakidou, E., Glenn, S., Krish, V. S., Miller-Petrie, M. K., . . . Liang, X. (2019). Mortality, morbidity, and risk factors in China and its provinces, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. The Lancet, 394(10204), 1145–1158.
[11] Pan, X. F., Wang, L., & Pan, A. (2021). Epidemiology and determinants of obesity in China. The lancet. Diabetes & endocrinology, 9(6), 373–392.
[12] Zhu, Z., & Yin, P. (2023). Overweight and obesity: The serious challenge faced by Chinese children and adolescents. Journal of global health, 13, 03036.
[13] McMahon, K., & Howard, S. (2024, December 6). China now accounts for roughly one quarter of diabetes cases worldwide. EHN.
[14] Dang, J., Liu, Y., Cai, S., Zhong, P., Shi, D., Chen, Z., Zhang, Y., Dong, Y., Ma, J., & Song, Y. (2024). Secular trend and projection of overweight and obesity among Chinese children and adolescents aged 7–18 years from 1985 to 2019: Rural areas are becoming the focus of investment. Chinese Medical Journal.
[15] Work Updates - Shenzhen Municipal Health Commission Website. (n.d.). https: //wjw.sz.gov.cn/xxgk/gzdt/content/post_11496219.html