

Epidemiological Status and Harms of Simple Obesity

Wei Wang

Heilongjiang University of Chinese Medicine, Harbin, Heilongjiang, China

1815065465@qq.com

Abstract. In recent years, simple obesity, a chronic metabolic disease caused by an imbalance between energy intake and expenditure, has shown a significant upward trend globally, particularly among children and adolescents, where its prevalence is rapidly increasing. Based on multiple epidemiological studies from both domestic and international sources, this paper reviews the changes in the incidence of simple obesity, gender and age distribution characteristics, urban-rural and regional disparities, and influencing factors. It provides a comprehensive analysis of the profound health and social system impacts of simple obesity. Research indicates that simple obesity not only significantly increases the risk of metabolic diseases, cardiovascular diseases, and psychological disorders, but also exerts multifaceted pressure on public healthcare resources, the quality of the labor force, and the socio-economic structure. To curb its growing prevalence, it is essential to strengthen population monitoring and health education, promote multi-departmental intervention, and establish a life-cycle prevention and control system.

Keywords: Simple Obesity; Epidemiology; Health Risks; Social Burden; Childhood Obesity.

1. Introduction

Simple obesity refers to a condition characterized by a persistent and abnormal increase in body weight due to excessive energy intake relative to energy expenditure, in the absence of endocrine, metabolic, or organic disorders. Essentially, it is a chronic metabolic disorder closely associated with genetic factors, dietary habits, reduced physical activity, and social environment influences [1]. In recent years, with the acceleration of industrialization and urbanization, changes in lifestyle, and the widespread availability of high-calorie diets, the prevalence of simple obesity has continued to rise globally. It has now become one of the most common non-communicable chronic diseases worldwide [2].

The World Health Organization (WHO) as early as 1997 identified obesity as “the most neglected public health problem” globally [3]. According to the *Global Obesity Observatory* report (2023), more than 1.3 billion adults worldwide are affected by obesity, and it is projected that by 2035, half of the global population will be either overweight or obese [4]. In China, along with rapid economic development and the “Westernization” of lifestyles, the obese population has grown significantly. The *Report on Nutrition and Chronic Disease Status of Chinese Residents (2020)* revealed that among adults aged 18 and above, the prevalence of overweight and obesity reached 34.3% and 16.4%, respectively, while the obesity rate among children and adolescents aged 6 to 17 reached 7.9% [5]. Particularly concerning is the growing prevalence of childhood simple obesity, which has become a focal point of public health attention both in China and worldwide. Childhood obesity tends to persist into adulthood, substantially increasing the risk of developing metabolic diseases such as hypertension, type 2 diabetes, and atherosclerosis later in life. Moreover, it is frequently accompanied by psychological issues, including inferiority complex and anxiety [6]. Therefore, obesity should not be viewed merely as a “body shape issue,” but rather as a chronic disease that profoundly affects lifelong health and imposes a heavy social and economic burden.

Addressing obesity has become a key focus of national health strategies worldwide. The Chinese government has introduced several policy measures, including the *Healthy China 2030 Planning Outline* and the *Implementation Plan for the Prevention and Control of Obesity among Children and Adolescents (Trial)* (2020), emphasizing multi-level coordination across individuals, families, schools, communities, and media to combat obesity [7][8]. Nevertheless, despite these governmental efforts, the epidemic trend of simple obesity remains concerning. This underscores its complex

etiology and the difficulties in prevention and control, highlighting the urgent need for multifaceted strategies encompassing public health interventions, health education, and urban environmental design.

Simple obesity has evolved from an “individual issue” to a pressing social problem, with increasingly severe trends and consequences. This review aims to systematically summarize the current epidemiological status of simple obesity, with particular focus on the prevalence among different age groups and populations, and to discuss its multifaceted impacts on individual health and social systems. The goal is to provide theoretical and empirical support for the formulation of relevant policies and the optimization of intervention strategies.

2. Epidemiological Status of Simple Obesity

2.1 Global Prevalence Trends

In recent decades, obesity has emerged as one of the most pressing public health challenges worldwide, spreading like a “silent epidemic” across countries and regions. According to data from the World Health Organization (WHO) [9], the global number of overweight and obese individuals has increased explosively over the past 50 years. By 2016, 39% of adults aged 18 years and older were overweight, and 13% met the criteria for obesity. In some developed countries, these rates remain exceptionally high. For instance, in the United States, data from 2021 indicate that approximately 42.4% of adults suffer from obesity, making it one of the countries with the highest adult obesity rates globally. European countries have also witnessed an alarming rise in obesity prevalence—nations such as the United Kingdom and Germany report continuous year-on-year increases in obese populations, imposing a substantial burden on public health systems. Similarly, developed regions such as Australia are experiencing high levels of obesity prevalence, accompanied by a corresponding rise in obesity-related diseases.

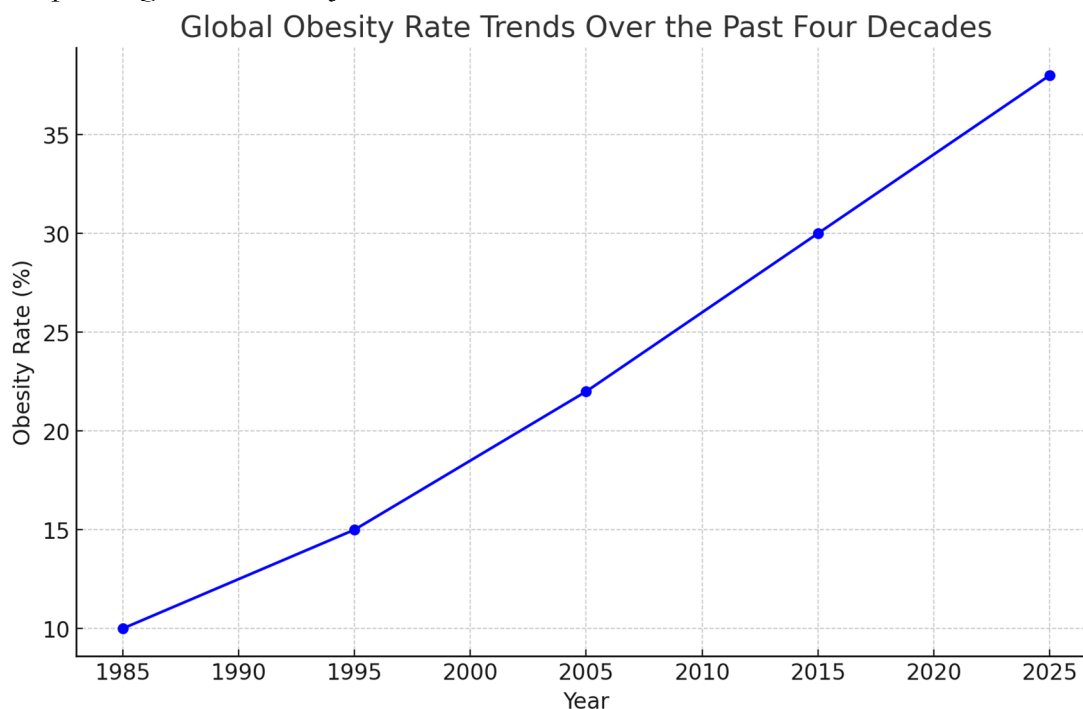


Figure 1. Global Obesity Rate Trends Over the Past Four Decades

More alarmingly, the rates of obesity among children and adolescents are also rapidly increasing—a phenomenon observed globally. Between 1975 and 2016, the prevalence of obesity among individuals aged 5 to 19 years rose dramatically from less than 1% to over 6% among boys and 8% among girls. In rapidly developing economies such as Brazil and Indonesia, childhood obesity has

become particularly prominent. The combined effects of accelerated urbanization, the widespread adoption of Western dietary habits, and a significant reduction in physical activity have led to an astonishing growth rate in childhood obesity. Even in regions such as Africa and South Asia—traditionally characterized by malnutrition—an upward trend in obesity rates is becoming evident. In several African cities, the proliferation of Western fast food, together with a lifestyle shift from manual labor to sedentary occupations, has resulted in an annual increase of 2%–3% in obesity prevalence. Similarly, in South Asia, economic development and rising household purchasing power have driven the consumption of high-calorie, high-fat foods. The lack of effective nutritional education and physical activity promotion has further exacerbated the obesity problem in these regions [10].

2.2 Epidemiological Status in China

In recent years, China has not been immune to the global surge in obesity. With rapid economic growth, accelerating urbanization, and significant lifestyle transformations, Chinese residents have experienced marked changes in dietary structure and physical activity patterns, leading to a continuous rise in the prevalence of simple obesity. According to data from the *Report on Nutrition and Chronic Disease Status of Chinese Residents (2020)*, 34.3% of adults aged 18 and above are overweight, and 16.4% are obese — both figures show substantial increases compared with 2002. Among urban residents, the obesity rate has risen by nearly 8 percentage points over the past two decades, while rural areas have seen an increase of more than 5 points. In major cities such as Beijing, Shanghai, and Guangzhou, the combined rate of overweight and obesity among adults exceeds 40%, making obesity a major determinant of urban health status [11].

The problem is particularly pronounced among children and adolescents. A study conducted by the Chinese Center for Disease Control and Prevention revealed that the obesity rate among children and adolescents aged seven and above increased from 12.2% in 2010 to nearly 20% in 2020, with obesity more prevalent among urban than rural children, and among boys than girls. Urban children are more likely to adopt unhealthy lifestyles characterized by excessive intake of high-energy foods, insufficient exercise, and prolonged sedentary behaviors. Fast-food and dessert outlets are widespread in cities, and children frequently consume high-calorie foods such as hamburgers, fries, and soft drinks. Moreover, academic pressure leaves limited time for physical activity — approximately 60% of urban children exercise less than one hour per day, compared with around 40% in rural areas, both figures being far below recommended levels [12].

To address the growing obesity burden, the Chinese government and public health authorities have released several policies and guidelines. The *14th Five-Year Plan for National Health (2022)* explicitly called for “curbing the rising trend of childhood and adolescent obesity,” emphasizing the importance of nutrition education and physical fitness management [13]. Local governments have also implemented initiatives such as “Healthy Campus” programs, promotion of balanced diets, and expansion of physical education curricula and activity time. Some regions have introduced parental nutrition education programs to enhance awareness of healthy eating and exercise among families.

2.3 High-Risk Populations: The Case of Children

Childhood represents a critical period for the development of metabolism, dietary behavior, and lifestyle habits. Once simple obesity occurs, it is highly likely to persist into adulthood, significantly increasing the risk of chronic conditions such as cardiovascular diseases, diabetes, and metabolic syndrome. Its etiology is multifactorial, involving genetic, environmental, psychosocial, and behavioral influences — among which family diet, parent-child interaction, school environment, and media exposure play particularly important roles.

From a familial and genetic perspective, children with one obese parent have a 2–3 times higher risk of obesity than those with normal-weight parents, and when both parents are obese, the risk rises to 70–80%. This pattern is influenced not only by genetic inheritance but also by the imitation of parental behaviors such as preference for high-calorie diets and sedentary lifestyles. Family dietary

structure exerts a substantial impact: frequent consumption of fried foods, sugary drinks, and processed meats leads to excessive caloric intake and fat accumulation. A survey of urban households found that approximately 40% consumed fried foods at home at least three times a week, and 25% regularly purchased sugary beverages for their children.

Behavioral factors such as insufficient physical activity and inadequate sleep also play critical roles. Epidemiological surveys across six major Chinese cities indicate that primary school children who exercise less than one hour daily exhibit significantly higher obesity risks. The proliferation of electronic devices has further increased screen time, reducing opportunities for outdoor activities [14]. Studies show that children who use electronic devices for more than two hours daily have a 30% higher obesity prevalence compared to those who use them for less than one hour, while children sleeping fewer than nine hours per night face a 40% higher risk of obesity.

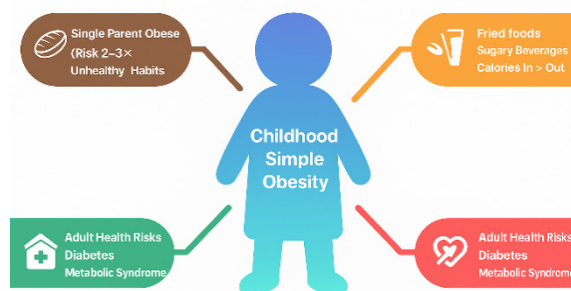


Figure 2. Analysis of Causes of Childhood Simple Obesity

In recent years, the Ministry of Education of China, together with multiple government departments, has implemented programs such as the *Nutrition Improvement Plan*, *Standards for Student Physical Health*, and initiatives promoting healthy school canteens to curb obesity through educational interventions. However, the overall effectiveness of these measures requires long-term monitoring and evaluation [15]. Some schools have responded actively by improving cafeteria food options and expanding physical education classes, though limitations in space and staffing remain obstacles to full implementation. Moreover, since family and social environments have profound effects on children’s lifestyle habits, school-based interventions alone are insufficient. Families should foster healthy dietary environments and model positive behaviors by reducing the purchase of high-calorie foods, while society must enhance market regulation of children’s food and restrict advertising of high-sugar, high-fat products to create a holistic environment conducive to children’s health.

3. Health Hazards of Simple Obesity

3.1 Impact on Individual Health

The adverse effects of simple obesity on individual health are systemic and multifaceted, encompassing physiological and psychological domains that interact to form a vicious cycle.

From a metabolic standpoint, simple obesity directly contributes to the development of metabolic syndrome, including insulin resistance, hypertension, dyslipidemia, and type 2 diabetes [16]. Clinical data indicate that when the body mass index (BMI) exceeds 28 kg/m², the incidence of insulin resistance is 3.5 times that of normal-weight individuals, with even higher risks among those with abdominal obesity (waist circumference ≥ 90 cm in men and ≥ 85 cm in women). Such metabolic disturbances disrupt glucose regulation — obese individuals exhibit fasting glucose levels 1.2 mmol/L higher on average, delayed postprandial glucose peaks, and slower glucose clearance, eventually leading to type 2 diabetes. A cohort study of Chinese adults found that the 10-year

cumulative risk of developing type 2 diabetes among obese individuals reached 34.6%, 7.2 times that of normal-weight counterparts [17].

The cardiovascular system is another major target of obesity-related damage. Prospective studies have shown that obese individuals have significantly higher cardiovascular mortality rates than those of normal weight. Specifically, for every 5 kg/m² increase in BMI, the risk of coronary heart disease rises by 29%, stroke by 16%, and heart failure by an astonishing 52%. Anatomical studies reveal that the average heart weight of obese individuals is 20% higher than normal, and left ventricular wall thickness increases by 15% due to chronic overload. Moreover, obesity-induced dyslipidemia — characterized by elevated triglycerides and reduced high-density lipoprotein — accelerates atherosclerosis, with aortic intima-media thickness increasing by 0.03 mm annually, 1.8 times that of non-obese individuals .

Elevated cancer risk represents another critical health threat associated with obesity. Obesity is strongly linked to several cancers, particularly breast and colorectal cancer, with greater impact observed among women. Postmenopausal women with obesity face a 58% higher risk of breast cancer compared with normal-weight peers, largely due to excessive estrogen secretion from adipose tissue (average estradiol levels increase by 40%), which promotes abnormal proliferation of mammary epithelial cells. The risk of colorectal cancer is associated with obesity-induced gut microbiota dysbiosis — the abundance of carcinogenic bacteria (e.g., *Fusobacterium*) increases 2.3-fold, while short-chain fatty acid production decreases by 30%, compromising the intestinal mucosal barrier .

On the psychological level, simple obesity often coexists with self-esteem issues, anxiety, depression, and social withdrawal. Epidemiological data indicate that the prevalence of depressive symptoms among obese individuals is 21.3%, 2.1 times higher than that among normal-weight individuals; for moderate-to-severe obesity (BMI ≥ 32 kg/m²), this figure rises to 34.7%. Such psychological distress stems from societal stigma — approximately 68% of obese individuals report experiencing “weight discrimination,” including workplace barriers and social exclusion. This chronic stress activates the hypothalamic-pituitary-adrenal axis, elevating cortisol levels by 18%, which further stimulates appetite and fat accumulation, creating an “obesity–depression–more obesity” cycle. Among adolescents, obesity-related shame and body image concerns often diminish academic motivation and social engagement. A study among Chinese middle school students revealed that obese adolescents scored 27 points lower (out of 100) in peer acceptance and were 40% less likely to speak in class; their homework quality scores were 15 points lower, reflecting persistent self-doubt. Alarming, this psychological impact may persist into adulthood — obese adolescents face a 2.8-fold higher risk of social anxiety disorder by age 30 compared to normal-weight peers .

HEALTH DAMAGE CHAIN OF SIMPLE OBESITY

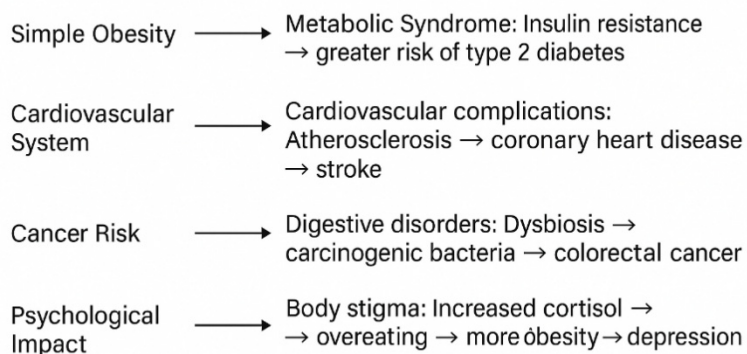


Figure 3. Health Impact Chain of Simple Obesity

Further studies have shown that obesity is closely associated with functional disorders such as sleep apnea, asthma, and menstrual irregularities. The prevalence of obstructive sleep apnea among

obese individuals is 38.2%, 5.3 times that of normal-weight individuals, with an average of 35 apnea episodes per night and a minimum oxygen saturation of 82%. This chronic hypoxia contributes to daytime sleepiness, reduced concentration, and a 2.1-fold increase in traffic accident risk. Regarding asthma, the incidence among obese children is 19.7%, 67% higher than that of normal-weight children, primarily due to thoracic fat compression and a 30% increase in airway reactivity. Among obese women, 42.5% experience menstrual irregularities, and 8.3% develop secondary amenorrhea — conditions linked to obesity-induced hyperandrogenism (testosterone levels increased by 25%) that suppress ovulation.

3.2 Impact on the Social System

The adverse effects of simple obesity have long transcended the individual level, evolving into a major public health issue that undermines social and economic efficiency.

The most direct manifestation of this impact is the dramatic increase in healthcare expenditures. According to *The Lancet* (2020), obesity-related diseases account for approximately 12%–15% of total global healthcare spending. At the level of individual diseases, obesity contributes to 68% of the total medical costs of type 2 diabetes and 43% of expenditures related to coronary heart disease. In China, the massive population affected by chronic diseases such as diabetes and hypertension—largely driven by obesity—places a substantial burden on the national medical insurance system, reducing the overall productivity and health quality of the workforce. Data from 2022 show that direct medical costs associated with obesity-related diseases in China reached 521.6 billion RMB, accounting for 8.7% of total national health expenditures. Among these, expenses for diabetic complications (e.g., renal failure, retinopathy) have been increasing at an annual rate of 11.3%. Moreover, obese individuals are hospitalized an average of 4.2 days longer and make 6.8 more outpatient visits per year than those of normal weight, consuming a disproportionate share of healthcare resources.

The detrimental effects of obesity on labor productivity are equally striking. Research indicates that obese employees exhibit significantly higher rates of absenteeism and sick leave compared to their normal-weight counterparts, and they are more prone to fatigue and reduced attention at work. In the manufacturing sector, obese workers demonstrate an average of 1.2 fewer effective working hours per day and a 37% higher production error rate. In the service sector, customer complaints involving obese employees are 2.3 times higher, a trend linked to both decreased physical endurance (lifting capacity reduced by 28%) and diminished emotional regulation. Economic analyses estimate that obesity-related productivity losses in China correspond to approximately 1.2% of GDP, with the construction and transportation industries being the most affected.

Within the education system, obesity poses long-term risks to population quality and social equity. Obese children often experience bullying, academic stress, and psychological trauma, necessitating coordinated interventions from families and society. Surveys indicate that 38.5% of obese primary school students report experiencing bullying, 3.1 times higher than their normal-weight peers. Common forms include name-calling and social exclusion. Such experiences negatively affect academic performance—obese children score an average of 12.5 points lower in mathematics and Chinese than the class mean, and their classroom attention spans are reduced by 25%. The long-term consequences are equally concerning: the proportion of obese children who later pursue higher education is 18 percentage points lower than that of normal-weight individuals, which in turn limits their career opportunities. Consequently, obesity not only compromises current population health but also perpetuates educational inequality, potentially hindering social mobility across generations.

4. Conclusion and Recommendations

As a lifestyle-related disease, simple obesity has exhibited clear trends toward globalization, rejuvenation, and chronicity. Although its pathophysiological mechanisms are well understood within the medical community, significant weaknesses remain in public policy, family education, and health

intervention practices. These deficiencies allow obesity to continue exerting adverse effects on individual health and socioeconomic development.

To effectively address this growing issue, a comprehensive, multi-sectoral prevention and control system must be established. From the **governmental perspective**, efforts should focus on strengthening health education campaigns to promote scientific dietary and exercise knowledge among the public. Policies should also improve nutritional standards for school meals, reform physical education curricula to increase students' daily activity time, and employ fiscal measures—such as taxation—to regulate the production and consumption of high-calorie foods, thereby shaping a healthier food environment.

The **medical system** must also play a crucial role by incorporating “weight management” into routine health examinations, with regular monitoring of BMI and waist circumference. Screening and early intervention systems should be developed to provide individualized guidance for people with different obesity profiles. Additionally, medical training at the primary care level should be enhanced, and greater investments made in obesity-related research to strengthen the overall capacity for prevention and treatment.

At the **family level**, parents should serve as role models by cultivating healthy eating habits in children from an early age, limiting the intake of high-calorie foods, and fostering active family lifestyles. Regular weight monitoring should be practiced, with timely interventions if excessive weight gain is observed.

At the **societal level**, it is essential to strengthen psychological support for obese individuals and reduce stigma through public education and inclusive social campaigns. Establishing professional mental health services for obese populations can provide much-needed psychological counseling, while public initiatives can increase empathy and acceptance, fostering a supportive and non-discriminatory social environment.

Only through comprehensive interventions that integrate physiological, psychological, and social dimensions can the epidemic of simple obesity be effectively curbed. Such efforts will not only improve population health but also contribute to the sustainable development and vitality of society.

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