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OBESITY AND SOCIAL INEQUALITIES: HOW SOCIOECONOMIC FACTORS AFFECT HEALTH

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ABSTRACT

Background: Obesity represents one of the greatest public health challenges of the 21st century. Its prevalence is strongly linked to socioeconomic factors rather than being solely the result of individual dietary choices or lifestyle behaviors. According to the World Health Organization (WHO), obesity is a consequence of excessive fat accumulation leading to metabolic disorders, an increased risk of cardiovascular diseases, type 2 diabetes, and premature mortality. Over the past decades, the global prevalence of obesity has risen dramatically, increasingly affecting individuals with lower socioeconomic status. This highlights the need to analyze the social determinants underlying this phenomenon.
Objective: The aim of this paper was to present and analyze the current state of knowledge regarding the impact of socioeconomic factors, such as education level, income, place of residence, and access to healthcare, on the prevalence of obesity, as well as to discuss their health and social consequences.
Methods: A literature review was conducted using scientific databases including PubMed and Google Scholar, as well as reports from international organizations such as the World Health Organization (WHO) and the Organisation for Economic Co-operation and Development (OECD). The search focused on recent publications examining the relationship between socioeconomic status and obesity. The review included original studies, review papers, and reports analyzing the effects of education, income, place of residence, and healthcare accessibility on obesity risk and its health outcomes.
Results: The analysis revealed that individuals with lower socioeconomic status are significantly more likely to suffer from overweight and obesity. Contributing factors include limited access to healthy foods, infrastructure that promotes physical activity, preventive healthcare, and health education. Residents of areas with lower socioeconomic development are more exposed to phenomena such as "food deserts" and "food swamps," which promote unhealthy eating habits. Furthermore, people living with obesity often experience stigma and discrimination, leading to reduced quality of life and lower treatment effectiveness.
Conclusions: Obesity is not only a medical issue but also a social one, deeply rooted in socioeconomic structures. Effective prevention requires an integrated, systemic approach that combines actions in education, health policy, and urban planning. Key measures include improving access to healthy food, developing infrastructure that supports physical activity, enhancing the quality of healthcare, and reducing economic barriers. Reducing social inequalities can significantly contribute to lowering the prevalence of obesity and its long-term health consequences.

KEYWORDS

Obesity, Social Inequalities, Socioeconomic Status, Socioeconomic Factors, Education and Obesity, Income and Obesity, Rural and Urban Differences, Access to Healthcare

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Introduction

Obesity is defined as an excessive accumulation of body fat that can lead to deterioration in health and the overall functioning of the body. The World Health Organization (WHO) classifies it as a chronic disease that significantly increases the risk of developing type 2 diabetes, cardiovascular diseases, cancer, musculoskeletal disorders, and numerous psychosocial problems (WHO, 2025; Williams et al., 2024). Diagnosis is based on body weight and height measurements, followed by the calculation of the Body Mass Index (BMI), which is the ratio of weight (kg) to height squared (m^2). In adults, obesity is diagnosed when the BMI equals or exceeds 30 kg/m^2 (WHO, 2025). Despite limitations such as its inability to distinguish between muscle and fat mass, BMI remains the primary and most widely used epidemiological tool for assessing the prevalence of obesity in populations (Yilun et al., 2024).

The scale of the obesity problem continues to grow. Since 1990, the global prevalence of obesity among adults has more than doubled, and among adolescents, it has quadrupled. Studies conducted in 2022 indicate that the number of people with overweight reached 2.5 billion worldwide, including over 890 million individuals living with obesity (WHO, 2025). This means that nearly one in eight adults globally is affected

by this condition. Once considered typical of high-income countries, obesity has been rapidly increasing in low- and middle-income countries as well, underscoring its global and systemic nature (WHO, 2025).

There is growing scientific evidence that obesity is shaped by social and structural determinants of health such as education level, income, place of residence, access to healthcare, and food systems (Williams et al., 2024). These factors influence both exposure to environments conducive to weight gain and individuals' ability to engage in prevention and treatment efforts.

The aim of this article is to present and summarize the current state of knowledge on the impact of socioeconomic factors on the prevalence of obesity, taking into account its health and social consequences. By analyzing recent data and studies, this review seeks to demonstrate that understanding the relationship between obesity and the aforementioned socioeconomic factors is crucial for designing effective public health interventions that can help reduce health inequalities associated with obesity.

Materials and Methods

This review analyzed scientific publications examining the relationship between socioeconomic factors and the prevalence of obesity, as well as its health and social consequences. The aim of the material selection was to obtain, as far as possible, an up-to-date and comprehensive overview of the issue in various social, cultural, and economic contexts. A comprehensive literature search was conducted in electronic databases including PubMed and Google Scholar, as well as on the websites of international institutions such as the World Health Organization (WHO) and the Organisation for Economic Co-operation and Development (OECD). The following keywords were used: *„obesity", „social inequalities", „socioeconomic status", „socioeconomic factors", „social determinants of health" „education and obesity", "income and obesity", "rural and urban differences",* and *„access to healthcare".*

The review included both original research articles describing population-based, cohort, and cross-sectional studies, as well as review papers, meta-analyses, and reports from health organizations. Publications selected for further analysis met the following criteria:

- Addressed adults and/or children in the context of obesity prevalence,
- Analyzed socioeconomic factors such as education, income, place of residence, and access to healthcare,
- Contained quantitative and qualitative data allowing for assessment of the relationship between socioeconomic factors and obesity prevalence.

Incomplete publications, those lacking scientific evidence, and purely theoretical works were excluded from the analysis. All eligible materials were then analyzed in terms of methodology, study population, applied socioeconomic indicators, and social context. The results were compiled and categorized into key thematic areas: education, income, place of residence and environment, access to healthcare, and the health and social consequences of obesity.

Results

1. Education

The level of education is one of the most significant socioeconomic factors influencing the risk of developing obesity and the overall health status of the population. Numerous studies have shown that a low level of education is strongly associated with a higher risk of overweight and obesity, particularly in high-income countries (Truthmann et al., 2017; Witkam et al., 2021; Olsen et al., 2023; Pavela et al., 2016). Education affects both the formation of health-related attitudes and the ability to evaluate information concerning nutrition, physical activity, and the prevention of chronic diseases [Darmon & Drewnowski, 2015; OECD, 2010). Individuals with higher education levels are more likely to engage in health-promoting behaviors such as regular physical activity, avoiding excessive consumption of highly processed foods, and maintaining greater awareness of healthy body weight (Truthmann et al.,2017; Olsen et al., 2023).

Additionally, individuals with lower education levels more frequently consume cheaper, high-calorie foods with low nutritional value. This tendency is driven both by financial constraints and by a lack of knowledge about the principles of balanced nutrition (Darmon & Drewnowski, 2015; OECD, 2010; Marmot, 2017). Studies conducted in Europe and the United States have shown that education, particularly among women, has a protective effect against obesity. In this group, the relationship between education and BMI is especially evident—the higher the level of education, the lower the BMI (Pavela et al., 2016; Jaacks et al. (2019).

An important mediating mechanism between education and obesity is the relationship between education, income, and occupational status. Stable and better-paid jobs are more often held by individuals with higher

education, which translates into greater opportunities to maintain a healthy lifestyle, participate in preventive programs, and access healthcare services (Pavela et al., 2016; Marmot, 2017; Jaacks et al., 2019). Conversely, a lower level of education is often associated with employment in occupations characterized by high stress levels and low job control, which may contribute to the development of obesity through increased caloric intake, limited physical activity, and chronic psychological stress (Jaacks et al., 2019; Chen et al., 2016).

Moreover, education plays a crucial role in shaping social attitudes toward body image. Better-educated individuals show greater interest in public health campaigns and are more likely to participate in obesity prevention programs, whereas people with lower education levels demonstrate visibly less engagement in such initiatives (Pavela et al., 2016; OECD, 2010). OECD studies from 2010 indicate that educational disparities are among the most persistent and challenging factors contributing to health inequalities related to obesity (OECD, 2010).

Furthermore, intergenerational aspects are also significant, as parental education levels strongly correlate with the risk of obesity among children and adolescents (Macintyre et al., 2002; Braveman & Gottlieb, 2014; Singh et al., 2017). Families with higher education levels are more likely to promote healthy eating habits, encourage physical activity, and monitor screen time, while families with lower education levels more often exhibit unhealthy eating patterns and limited awareness of the consequences of overweight.

From a public health perspective, these findings clearly indicate that investing in education—both health-related and systemic—is one of the most effective long-term strategies for reducing obesity and its health consequences (Williams et al., 2024; OECD, 2010; Singh et al., 2017). Increasing health awareness among children, adolescents, and adults, implementing nutrition education in school curricula, and promoting healthy lifestyles in workplaces and local communities should form the foundation of health policies aimed at reducing inequalities related to obesity.

2. Income

Financial constraints often force individuals to choose highly processed foods rich in sugars and fats due to their lower price and greater availability. Numerous studies indicate that people with lower incomes tend to consume foods of lower nutritional quality, and such behaviors contribute to excessive weight gain through a positive energy balance (Williams et al., 2024; Darmon & Drewnowski, 2015; Pavela et al., 2016; Swinburn et al., 2019; OECD, 2010). Lower household income is associated with poorer diet quality and limited access to fresh products—particularly fruits, vegetables, and whole grains—which are often more expensive than highly processed foods (Marmot, 2017; Golden & Earp, 2012). The cost of a healthy diet represents a significant barrier for populations with lower socioeconomic status, as improvements in diet quality are typically accompanied by a proportional increase in food expenditure (Darmon & Drewnowski, 2015).

Individuals with lower incomes also face more challenges in engaging in regular physical activity, which may result from limited access to sports facilities or recreational areas (Williams et al., 2024; Pavela et al., 2016). This leads to reduced physical activity, which, combined with an unhealthy diet, increases the risk of obesity and its complications. Income also has an indirect effect through its influence on educational opportunities, housing conditions, and access to healthcare and preventive services. In lower socioeconomic groups, this results in a cumulative effect of adverse health determinants (Marmot, 2017; Jaacks et al., 2019).

On the other hand, the relationship between income and obesity can be non-linear and may vary depending on a country's level of economic development. In high-income societies, obesity is more prevalent among individuals with lower incomes, mainly due to unequal access to healthy food and opportunities for physical activity. Conversely, in developing countries, obesity can also affect wealthier populations, where higher income levels promote sedentary lifestyles and increased consumption of high-calorie foods (Darmon & Drewnowski, 2015; Swinburn et al., 2019; Jaacks et al., 2019). These differences may stem from deeper social and structural determinants, including the inequitable distribution of resources, lack of policies supporting healthy choices, and systemic inequalities in access to education and healthcare (Jaacks et al., 2019; Macintyre et al., 2002).

As a result, income constitutes one of the key social determinants of obesity, both directly, by influencing lifestyle and dietary habits, and indirectly, by shaping the environments in which individuals make health-related decisions. Reducing these inequalities therefore requires systemic interventions, including the implementation of policies promoting healthy eating (e.g., taxation of sugar-sweetened beverages) and the development of infrastructure that facilitates physical activity regardless of income level (Marmot, 2017; Golden & Earp, 2012).

3. Place of Residence and Environmental Factors

Place of residence and related environmental factors play a significant role in shaping social inequalities, including the prevalence of obesity. Numerous studies confirm that spatial conditions, such as access to green spaces, public transportation, recreational and sports infrastructure, affect levels of physical activity, dietary habits, and, consequently, overall health behaviors (Braveman & Gottlieb, 2014; Singh et al., 2017; Chen et al., 2016). This relationship is particularly evident in large urban areas, where economic and social inequalities translate into disparities in access to health-promoting resources (Singh et al., 2017; Shimels et al., 2019; Shimels et al., 2017).

A frequently observed phenomenon in areas with lower socioeconomic status is the existence of so-called "food deserts" and "food swamps"—areas characterized, respectively, by limited access to healthy, fresh foods and by high accessibility to fast food outlets and highly processed products (Bevel et al., 2023; Oh et al., 2024). Exposure to such environments increases the risk of obesity and obesity-related cancers (Congdon, 2019). Similarly, these environments, when combined with poor green infrastructure, lead to lower levels of physical activity and an increased risk of overweight and obesity (Congdon, 2019; Wong et al., 2018).

Higher obesity rates are also observed in rural areas, which may be attributed to limited access to healthcare, public transportation, green spaces, and infrastructure that supports physical activity (Byrd et al., 2018; Oshman et al., 2023). In urban areas, studies have shown clear differences in obesity prevalence depending on residents' race and socioeconomic status, linked to factors such as neighborhood safety, access to green areas, and the structure of the social environment (Shimels et al., 2019).

Neighborhoods with higher socioeconomic status typically offer better access to comprehensive medical care, stores selling healthy foods, parks, and recreational facilities, which translates into more favorable health outcomes among residents (Williams et al., 2024; Wong et al., 2018; Shimels et al., 2019; Shimels et al., 2017; Cohen et al., 2017).

At the population level, urban development and city expansion can have a dual impact on health. On one hand, dense urban layouts encourage walking and the use of public transportation; on the other, excessive urbanization, a lack of recreational spaces, and high environmental pollution contribute to sedentary lifestyles and an increased risk of obesity (Wong et al., 2018). Research suggests that urban structure and spatial planning can influence residents' health behaviors to a degree comparable with individual factors such as diet and physical activity (Wong et al., 2018).

Additionally, studies have demonstrated a link between obesity and neighborhood socioeconomic status in urban settings. Individuals living in poorer districts have a 20–40% higher risk of obesity compared to residents of wealthier neighborhoods. High population density, lack of spaces for physical activity, and widespread availability of unhealthy foods create so-called obesogenic environments, which perpetuate health inequalities among social groups (Wong et al., 2018; Shimels et al., 2019; Shimels et al., 2017; Cohen et al., 2017).

In summary, place of residence plays a crucial role in shaping obesity risk through its impact on lifestyle, access to health resources, and the broader social environment. Reducing spatial inequalities—through the development of green infrastructure, support for local healthy food markets, and improvement of public safety—constitutes an essential component of public health policy aimed at decreasing the prevalence of obesity and its related health consequences (Congdon, 2019; Wong et al., 2018; Shimels et al., 2019).

4. Access to Healthcare

Another key factor influencing the level of health inequalities related to obesity is access to healthcare, which largely determines both the opportunities for prevention and the effectiveness of interventions. Evidence indicates that people living in rural areas and those with lower socio-economic status are less likely to receive preventive advice, participate in obesity treatment, or achieve positive therapeutic outcomes (Williams et al., 2024; Byrd et al., 2018).

Inequalities in access to healthcare stem from various causes, such as lack of health insurance, high treatment costs, limited availability of specialists, long waiting times for appointments, or long distances to medical facilities—particularly in regions with low population density (Oshman et al., 2023; Gallo & Cheskin, 2021; Kirby & Kaneda, 2005; Washington et al., 2023).

Equally important as availability is the quality and organization of medical services. Among groups with lower socio-economic status, the quality of healthcare services is often lower due to a shortage of specialized personnel and underfunding of medical infrastructure (Fruh, 2017). In such environments, fragmented care—meaning a lack of coordination between different levels of the healthcare system—is also more common. The absence of integrated patient care reduces treatment effectiveness and, in the case of chronic diseases such as

obesity, leads to poorer adherence to medical recommendations, worse weight control, and more frequent complications (Washington et al., 2023; Fruh, 2017).

Limited access to obesity treatment is also observed in the context of racial and ethnic disparities. Studies show that individuals from ethnic minorities are less likely to be diagnosed with obesity and have lower chances of being referred for specialist treatment, including pharmacological or surgical therapy (Oshman et al., 2023; Fruh, 2017). These groups also show lower effectiveness of therapeutic interventions, which partly results from economic barriers but also from a lack of trust in the healthcare system and experiences of discrimination (Oshman et al., 2023; Gallo & Cheskin, 2021; Kirby & Kaneda, 2005; Puhl et al., 2018).

In the context of healthcare accessibility, the level of patients' health education also plays an important role, as it influences their willingness to seek help and adhere to medical recommendations. Individuals with lower levels of education are less likely to take the initiative in prevention and treatment, further deepening existing inequalities (Marmot, 2017; Jaacks et al., 2019).

Insufficient access to healthcare and limited quality of services contribute to an increased prevalence of diseases co-occurring with obesity, such as type 2 diabetes, hypertension, and cardiovascular diseases, which further burden both patients and the healthcare system (Blüher, 2019).

5. Health and Social Consequences

Obesity has a multidimensional impact on both individual health and the functioning of society. It is one of the main risk factors for many chronic diseases and affects millions of adults worldwide, resulting in a significant burden on healthcare systems and increased mortality (WHO, 2025).

Obesity not only shortens life expectancy but also reduces quality of life by limiting mobility, causing chronic pain, and contributing to multimorbidity (Fontaine et al., 2003; Sarwer & Polonsky, 2016).

Psychosocial consequences are also a significant issue, including an increased risk of depression, anxiety, and reduced self-esteem (Puhl et al., 2018; Täuber et al., 2018). In many societies, people with obesity experience discrimination and stigmatization, which can lead to reduced access to education, limited employment opportunities, and lower income (Puhl et al., 2018; Täuber et al., 2018; Bambra et al., 2019). Moreover, stigmatization can cause individuals to avoid contact with the healthcare system, delaying diagnosis and worsening health outcomes—creating a vicious cycle that deepens inequalities (Puhl et al., 2018; Täuber et al., 2018).

At the macro-social level, obesity generates substantial costs related to the treatment of comorbid diseases and contributes to the widening of social inequalities, creating a feedback loop. People with lower socio-economic status are more vulnerable to obesity while also bearing greater health, economic, and psychological consequences. In many cases, obesity leads to social exclusion, which limits opportunities for improving both economic and health conditions, reinforcing existing disparities (Williams et al., 2024; Jaacks et al., 2019; OECD, 2019; Golden & Earp, 2012).

As a result, obesity is not merely an individual issue but also a systemic one that requires coordinated preventive actions and interventions at the population level.

Discussion

The reviewed literature confirms that obesity is a complex social and health phenomenon, whose determinants extend beyond individual factors. Findings from available studies indicate that social and economic inequalities significantly influence both the risk of obesity and the effectiveness of preventive and therapeutic measures (Williams et al., 2024; Pavela et al., 2016; Marmot, 2017; Jaacks et al., 2019). The strongest associations are observed between a low level of education, limited income, residence in areas with unfavorable environmental conditions, and restricted access to healthcare, and an increased risk of overweight and obesity (Williams et al., 2024; Darmon & Drewnowski, 2015; Pavela et al., 2016; OECD, 2010; Singh et al., 2017; Chen et al., 2016). These factors form a complex network of interdependencies in which economic, educational, environmental, and health-related elements mutually reinforce one another, leading to the persistence of health inequalities within the population (Marmot, 2017; Jaacks et al., 2019; Chen et al., 2016).

It is also important to note that obesity is more prevalent among socially marginalized groups, particularly within communities of lower socio-economic status and among ethnic minorities (Williams et al., 2024; Byrd et al., 2018; Oshman et al., 2023; Fruh, 2017). In these populations, there is not only greater exposure to environmental factors conducive to obesity, but also limited access to healthcare and reduced opportunities to participate in preventive programs or treatment [Cohen, et al., 2017; Washington et al., 2023). In many developed countries, the phenomena known as "food deserts" and "food swamps" are also observed—

areas where access to nutritious, healthy food is limited, while fast food outlets and highly processed food dominate (Bevel et al., 2023; Oh et al., 2024; Congdon, 2019). Such food environments are more often located in low-income neighborhoods, contributing to a higher prevalence of obesity and related conditions such as type 2 diabetes and cardiovascular diseases (Oh et al., 2024; Wong et al., 2018; Blüher, 2019).

Another aspect discussed in the literature concerns the influence of the physical and urban environment. Research shows that limited access to green spaces, recreational infrastructure, and public transport reduces levels of physical activity and encourages a sedentary lifestyle (Macintyre et al., 2002; Braveman & Gottlieb, 2014; Congdon, 2019; Wong et al., 2018). Individuals living in rural areas or neighborhoods with lower socio-economic status have fewer opportunities to use sports facilities or participate in health promotion programs (Byrd et al., 2018). These factors contribute to poorer health outcomes and a higher prevalence of obesity within these groups (Williams et al., 2024; Congdon, 2019; Shimels et al., 2019; Shimels et al., 2017).

From a public health policy perspective, it is crucial to recognize that addressing obesity cannot be limited to individual-level actions, such as health education or the promotion of physical activity [OECD, 2010; Marmot, 2017). Integrated structural interventions are necessary to mitigate the influence of adverse socio-economic determinants, for example, by increasing access to healthy food, developing infrastructure that supports physical activity, and removing financial barriers to obesity treatment (Pavela et al., 2016; Marmot, 2017; Fruh, 2017; Golden & Earp, 2012). Research shows that population-level interventions focused on health equity and environmental changes yield more sustainable long-term effects in reducing obesity prevalence than approaches based solely on individual behavior modification (Golden & Earp, 2012).

An important issue also discussed in the literature concerns the stigmatization of people with obesity. Stigma and discrimination lead to poorer mental health, lower quality of life, and reduced willingness to seek treatment (Puhl et al., 2018; Täuber et al., 2018). Negative stereotypes about people with obesity, which are often present in both workplaces and healthcare settings, can result in unequal treatment and delayed diagnosis [25,36]. Moreover, individuals who experience stigmatization tend to avoid contact with the healthcare system, reinforcing a cycle of exclusion and deepening social inequalities (Puhl et al., 2018; Täuber et al., 2018).

Obesity also generates significant economic costs. It is estimated that without effective action, global obesity-related costs could reach up to three trillion US dollars annually by 2030 [OECD, 2019]. This burden affects not only healthcare systems but also the economy and labor market, primarily through increased sickness absence, reduced productivity, and social exclusion (Blüher, 2019; Sarwer & Polonsky, 2016).

For this reason, further interdisciplinary research is needed, taking into account medical, social, and economic perspectives. Applying a social-ecological model helps to better understand the interactions between individual health behaviors, social conditions, and systemic structures (Golden & Earp, 2012). Future research should particularly focus on comparative studies involving different social groups, genders, age categories, and urban–rural contexts, in order to develop more precise and effective public health strategies.

Obesity is not only a health problem but also a social, economic, and cultural phenomenon that requires a coordinated and systemic approach. Reducing social inequalities should be a key priority in public health policy, as only in this way can the scale of obesity and its long-term health and social consequences be effectively reduced.

Conclusions

In summary, obesity is a chronic disease with a complex, multifactorial etiology, deeply rooted in social inequalities. The presented findings indicate that socio-economic factors—such as education level, income, place of residence, and access to healthcare—shape both the risk of developing obesity and the capacity for effective prevention and treatment. These interrelations create a complex system in which social and economic disparities translate into differences in health behaviors, access to care, and quality of life.

Current evidence shows that overweight and obesity are more common among groups with lower socio-economic status, which contributes to the widening of health and social inequalities. Therefore, obesity should be perceived not only as a medical condition but also as a social and systemic issue that requires comprehensive and integrated public health interventions.

To effectively address obesity, multisectoral actions are needed, spanning education, healthcare, social policy, and urban planning. Structural changes are also crucial, including improving access to healthy foods while reducing exposure to unhealthy products, decreasing financial inequalities, and creating safe spaces for physical activity. Interventions focused solely on changing individual behaviors may prove insufficient. Strengthening the role of education and prevention, particularly among groups with lower socio-economic

status, and ensuring equal access to professional obesity treatment, with appropriate dietary and psychological support, are essential.

Combating the stigmatization and discrimination faced by individuals with excess body weight, which hinder treatment and reduce quality of life, is also a key element of effective obesity prevention strategies. This requires promoting an approach to healthcare based on empathy and equality, which considers both the social and psychological context of patients.

In the long term, such a comprehensive approach can meaningfully contribute to reducing the prevalence of obesity and related health inequalities, while also bringing economic and social benefits through lower treatment costs, improved quality of life, and increased societal productivity.

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