

Scientific Advice in the Fight Against Obesity

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ABSTRACT

Obesity is one of the most pressing pandemics of the 21st century, driven by a complex interplay of biological, social, economic and environmental factors. The evolution of obesity-related statistics is a growing concern that demands a coordinated response from different sectors. Recent scientific advances and pharmacotherapy innovations in obesity are encouraging; however, there are major challenges: high costs, ethical dilemmas, industry pressure and social stigma fueled by social networks and diet fads. This commentary emphasizes the urgent need for smarter strategies and reflects on how scientific advice could strengthen decision making surrounding obesity management. Scientific advice has a key role to play, if we are willing to listen.

COMMENTARY

Obesity is one of the concerning pandemics of the 21st century [1]. It is estimated that more than half of the world's population will be overweight and a quarter will be obese within 10 years if prevention and treatment measures are not strengthened [2]. Obesity is caused by multifactorial factors: genetic, environmental, social, economic and psychological, so its approach requires a comprehensive approach that transcends individual solutions [3]. Importantly, obesity is associated with numerous comorbid conditions including hypertension, cardiovascular disease, type 2 diabetes, hypercholesterolemia, hypertriglyceridemia, nonalcoholic fatty liver disease, and cancer, and even the development of severe disease after infection with viruses, imposing a significant economic burden on our health care system [4,5]. Obesity interact and is reinforced by other global concerns such as malnutrition, climate change, uncontrolled urbanization, food insecurity and unsustainable agriculture, exacerbating social inequalities as they affect the most vulnerable populations disproportionately. All of them contribute to an obesogenic environment that hinders the adoption of healthy lifestyles. For all these reasons, obesity is one of the major global crises with implications that go beyond the health domain to affect the environmental, economic and social dimensions. Despite advances in the understanding of its causes and consequences, the public policies implemented have shown limited results containing this epidemic. Obesity is constantly evolving and

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promises significant innovations in terms of diagnosis and treatment; then, major changes should be expected in the disease management. Traditionally, body mass index (BMI) has been the main diagnostic parameter for obesity, but its inability to reflect body composition, metabolic risk or individual differences has led to questions about its usefulness and to redefine obesity as a chronic disease characterized by metabolic dysfunction and not solely by excess weight [4,6]. This perspective incorporates metrics such as percentage of visceral fat, insulin resistance and inflammatory markers, allowing the identification of individuals with “metabolic obesity” even with normal BMI [7]. In addition, technologies such as metabolic sensors and genetic analysis are opening the door to personalized treatments, identifying “non-responders” to certain drugs and optimizing interventions [7]. This redefinition has profound implications for public policies that must go beyond the traditional model of “calories consumed vs. calories expended” [8]. In consequence, screening strategies could prioritize metabolic biomarkers rather than anthropometric measures, allowing earlier interventions [6]. It encourages a personalized approach that recognizes the heterogeneity of obesity [9]. For example, intermittent fasting, a non-pharmacological strategy that has gained attention in recent years, proposes metabolic regulation through a restructuring of eating patterns with the aim of promoting weight loss and improving metabolic parameters such as insulin sensitivity and reducing inflammation [10]. Health policies should adapt to this new conceptualization, promoting accessible diagnostic systems and training for health professionals in the use of these advanced metrics. Some experts foresee dozens of new drugs on the way, ushering in a new era in the treatment of obesity, but their monitoring should be closely monitored [11]. Recent pharmacological advances linked mainly to the well-known GLP-1 receptor agonists, which mimic the action of glucagon-like peptide type 1, such as semaglutide (also known as Ozempic) have revolutionized the treatment of obesity offering unprecedented opportunities [12]. The use of GLP-1 agonists can delay gastric emptying, improve insulin sensitivity, reduced appetite, achieve admirably the weight lost between 15 and 20%, and some of them have also shown some cardiovascular benefits in patients with obesity and cardiovascular diseases [13,14]. The SURMOUNT-1 clinical study has shown that tirzepatide achieves a weight loss of up to 22.5% after 72 weeks, surpassing semaglutide [5]. The use of retatrutide (a GLP-1/GIP/glucagon triple agonist), has shown weight loss of up to 24.2% in phase II trials,

outperforming current drugs [6]. However, GLP-1 agonists are not without challenges, these drugs also pose clinical, ethical and economic risks that must be addressed [15]. Its side effects such as nausea, vomiting, pancreatitis and arthritis may pose potential risks [15]. Another critical problem is the “rebound effect”, which suggests that these drugs require prolonged use, raising costs and raising questions about their sustainability [11]. On the other hand, the integration of GLP-1 agonists into public health systems is a challenge. With costs exceeding \$1,000 per month, these drugs are inaccessible to many populations, exacerbating health disparities [16]. Semaglutide is available under strict criteria in the UK National Health System and could serve as a referral model, but it would require refinements to guarantee equity [11]. The European Medicines Agency (EMA) has already warned about the potential problems and risks of misusing drugs such as Ozempic in people without a disease scenario. The World Health Organization (WHO) also emphasizes that these drugs are not a universal solution; their long-term use together their elevated affordability make them unfeasible for many populations. Pharmacological and preventive interventions approach obesity from opposite points. GLP-1 agonists, such as semaglutide, are ideal for rapid and effective clinical management of advanced obesity, improving weight, metabolic and appetite problems, but involve high costs, adverse effects, long-term adherence and access barriers; limiting their role as a universal solution. Preventive interventions (dietary education, promotion of physical activity and non-obesogenic environments) address root causes by offering structural changes with sustainable benefits, which despite being slower are essential to reduce the incidence of obesity at the population level. Neither is substituting or competing with the other, but rather public health policies must find a balance in complementarity, integrating both approaches to optimize long-term outcomes. Obesity policies should prioritize low-cost alternatives, expansion of prevention programs, and lack of access to health care in underserved or disadvantaged communities [17]. Policies should focus on preventing obesity from early stages of life, i.e., with a special focus on early childhood [18]. Policies should address the training of health professionals in the comprehensive management of obesity, combining pharmacotherapy, behavioral interventions and, when necessary, bariatric surgery [19]. Finally, their popularity, driven by social networks and celebrities, has generated debates about their indiscriminate use, high costs and the risk of perpetuating stigma towards people with obesity [20]; along with the alarming unregulated use, with risks of

overdose and access to counterfeit versions [21]. There are major ethical and social challenges in the use of these treatments for obesity. The rise of these types of drugs has reignited debates about the stigma associated with obesity [22]. The narrative that obesity is a “lack of willpower” persists, and the use of drugs can reinforce this perception by suggesting that weight is easily controlled with a “quick solution” [23]. Recent studies have documented that the use of these drugs can generate social tensions, with patients reporting judgments for “taking the easy way out” [9]. This stigma not only affects adherence to treatment, but also perpetuates inequalities, as people with fewer resources face barriers to accessing these drugs [19]. The influence of social media undoubtedly exacerbates these concerns. Worryingly, the promotion of unrealistic expectations through social media (Instagram, TikTok and X) that have popularized the use of Ozempic as a cosmetic weight loss tool and diverts attention away from its clinical purpose [15]. How to regulate online information and misinformation without restricting freedom of expression, while educating the population about the risks and benefits of these treatments poses a challenge to healthcare systems and governments. Public policies should include educational campaigns that demystify obesity and promote a scientific understanding of its treatment. Obesity is one of the persistent public challenges of the 21st century and requires an integration of the latest scientific advances, effective public policies and an empathetic understanding of its social implications [22,24]. Effective management of this disease requires sustainable and fair evidence-based policies with a multidimensional approach that integrates prevention, treatment and equity; where scientific advice has much to contribute [25]. However, the implementation of effective anti-obesity policies does not depend exclusively on the quality of the available science, but also on the way in which this science is translated, interpreted and applied in the political sphere. The fight against obesity was insufficiently focused on the individual for a long time, promoting behavioral changes based on nutritional education. It is now recognized that obesity is determined by food systems, genetics, urban environments, socioeconomic inequality and global production and marketing policies. This evolution in the scientific paradigm calls for an updated policy framework that allows for more systemic and structural responses [26]. Scientific advice does not always translate into effective policies. Obesogenic environments are a key factor in this epidemic and are characterized by easy and inexpensive access to ultra-processed foods and a lack of space to

promote sport [3]. Prioritizing regulatory measures for the prevention of non-obesogenic environments, nutrition education in school settings, ensuring equitable access to diagnosis and treatment, applying healthy food subventions and working to combat the stigma associated with obesity are essential [23]. As we look to the future, it is imperative that policy makers, the scientific community and society work together to promote metabolic health and global wellness. Scientific advice on obesity policy faces multiple challenges. The scientific knowledge translation to policy formulation is limited; it is a fact that there is a disconnect between evidence and policy, resulting in interventions that are ineffective or poorly adapted to local contexts. The scientific community is dominated by a biomedical view that excludes fundamental perspectives such as sociology, psychology and urbanism. The appropriate use of scientific advice can lighten the dialogue between policy makers and scientists, especially in the context of emergencies or complex issues such as obesity, ensuring that policies are guided by governance principles such as multidisciplinary, transparency, independence and rapid responsiveness [25,27]. Scientists can provide data on the efficacy and safety of treatments, as well as identify priority populations for interventions [12]. For instance, although low-income and ethnic minority communities have higher rates of obesity, they have less access to advanced treatment [9]. This evidence can guide resource allocation and targeted program design. However, translating science into policy faces barriers, such as political resistance and commercial interests [20]. Scientists must work in collaboration with policy makers, using interdisciplinary platforms to communicate findings in an accessible way and advocate for policies based on data, not external pressures [25]. It is crucial that policies are based on high quality evidence and evaluated in a transparent manner to distinguish between empirical evidence and subjective values in policy formulation [28]. Scientific advice should incorporate quantitative models, evidence-based interventions and a structural approach to address the several drivers of obesity. Effective obesity policies must be multifaceted, tailored to the demographic and socioeconomic characteristics of the population, and continuously evaluated to ensure their effectiveness and long-term sustainability. A study conducted in 2023 analyzed why many countries do not adopt taxes on sugar-sweetened beverages, despite their more than proven effectiveness, and observed that the absence of strategic planning, weak regulatory pressure and limited inclusion of scientific advice explain this gap between evidence and

action [29]. A crucial element in the effectiveness of scientific advice is the public perception of its legitimacy. Bleich et al. (2007) found that trust in scientific experts is the main predictor of attention to nutritional recommendations. However, such trust does not necessarily translate into behavioral changes, suggesting the need to complement technical evidence with more effective communicative, educational and cultural strategies [30]. In the face of the limits of the technocratic model of counseling, proposals to incorporate diverse voices in policy design are growing. Citizen science, community knowledge and the lived experience of people with obesity can enrich policy decisions, provide legitimacy and increase their effectiveness. Citizen participation in the design and implementation of obesity policies can improve the relevance and acceptability of these interventions. Certain community initiatives and nutrition and health education programs have been effective in promoting healthy habits and preventing obesity. Conversely, industry engagement in obesity policymaking is a contentious issue. Conflicts of interest and the influence of the food and pharmaceutical industry on advisory committees can bias recommendations and undermine public confidence. While collaboration can bring resources and expertise, there is also a risk of conflicts of interest that compromise policy integrity. For example, in their New Zealand study on marketing of food to children, the authors found that, although there was strong evidence for stricter regulation, policy decisions were conditioned by factors such as industry pressure and economic priorities [26]. The influence of the food and pharmaceutical industry on legislative decisions undoubtedly represents one of the greatest obstacles to the implementation of evidence-based policies. Economic agents generate pressure that diffls or limits the use of scientific knowledge [31]. This undermines the independence and transparency of regulatory processes. It is to impose accountability frameworks to ensure that decisions are based on the public interest and not on commercial benefits. For example, there is one emerging piece of evidence that should not be overlooked or left out of the regulatory equation and that is the pharmacological revolution of the aforementioned case of GLP-1 agonists. But despite all these challenges, there are presumably worthy examples of effective policies based on scientific advice. For example, historical data reviewed by Freire et al. (1994) show that there was already an international consensus on sugar reduction as a key strategy to prevent chronic diseases. This consistency in recommendations, sustained over decades, reflects the ability of scientific advice to generate clear guidance when

institutional conditions permit [32]. UK policy measures to restrict marketing and reform campaigns advertising unhealthy foods to children were designed on the basis of accumulating evidence on obesity and cardiovascular disease [33]. Another example is the tax on sugar-sweetened beverages in Mexico, which caused a 7% decrease in consumption after its implementation [13]. Another admirable work is that of the European Food Safety Authority (EFSA), which has issued key scientific opinions for the regulation of novel foods, nutrients, labeling and health claims. This institutionalized advisory structure has enabled the EU to move towards more coherent policies on nutrition and obesity [26]. Although more forceful action is still required, these advances show the potential of scientific advice to guide sustained policies over time [33]. Some studies have analyzed a posteriori obesity policies based on scientific evidence, through systematic reviews, comparative case studies and other approaches, in regions as diverse as Latin America, Europe, North America and global settings. Interventions are characterized by being multicomponent and comprehensive, combining physical activity promotion, nutrition education, fiscal strategies (such as taxes on sugar-sweetened beverages) and the use of food labeling. The conclusions drawn from these studies are that evidence-based strategies demonstrate potential to reduce caloric intake and improve the acceptance of preventive measures when adapted to the local context. These studies highlight that the success of these policies depends on three main factors: adaptation to the local cultural and socioeconomic context [34,35]; the integration of diverse stakeholders, including health professionals, educators and communities, a feature highlighted [36]; and the presence of political will and evidence-based strategies [34,37].

CONCLUSION

Obesity is such a complex problem that it requires a multifaceted and collaborative approach. Scientific advice must evolve to be more inclusive, transparent and adapted to local realities. The translation of scientific knowledge into effective public policy for obesity faces multiple challenges: institutional barriers, conflicts of interest, low public trust, and inadequate governance structures. However, there are also inspiring examples of how scientific advice has guided successful regulations. The challenge now is to consolidate more inclusive, independent and strategic advisory mechanisms that recognize the complexity of obesity and promote policy responses commensurate with the problem. Only through effective integration between science, policy,

industry and society can sustainable and equitable policies be developed that effectively address the obesity epidemic.

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CONFLICTS OF INTEREST

The author declares that there is no conflict of interest.

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