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OBESITY, LAYPEOPLE'S BELIEFS, AND IMPLICATIONS FOR CLINICIANS AND LEADERS OF HEALTHCARE ORGANISATIONS

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STRUCTURED ABSTRACT

BACKGROUND/AIM: Overweight and obesity (OAO) is a major and growing public health crisis in the world. There is convincing medical evidence that caloric overconsumption, rather than lack of exercise, is the primary driver of OAO.

METHODS: In this translation piece, we summarise our programme of research on laypeople's beliefs about the primary cause of OAO, the origins of these beliefs, and implications for clinicians and leadership in healthcare organisations.

RESULTS: In contrast to the medical consensus, our research conducted in several countries has found that approximately half the population mistakenly believes that lack of exercise is the primary cause of obesity. These misbeliefs have consequences: people who mistakenly believe that exercise is the most important factor are more likely to be overweight or obese than people who correctly believe that diet is the primary cause of obesity. We argue that these misbeliefs are caused in part by systematic and multi-pronged communications efforts by the food and beverage industry – a phenomenon we term 'leanwashing'.

CONCLUSIONS: Not only does leanwashing require public policy intervention by the government, healthcare professionals also need to respond appropriately. In this article we focus on the implications of 'leanwashing' for leaders of public health organisations, health delivery organisations, and clinicians.

INTRODUCTION

What do laypeople believe about the causes of obesity, where do these beliefs come from, and what can leaders of public health and health delivery organisations, medical educators, and clinicians do about it? In this translational piece, we report on a program of research we conducted and reported in the psychology and management literatures, from which we draw implications for medical leadership.

Overweight and obesity (OAO) is a major and growing public health crisis in the world. According to the World Health Organisation, in 2022, 2.5 million adults (18 years and older) were overweight – that is 43% of adults; of these 890 million were obese – that is 16% of adults [1]. There were 390 million overweight children (aged 5-19 years), and 37 million infants under 5 years old were overweight. The problem is getting worse: worldwide obesity has tripled since 1975. A recent study in *The Lancet* estimated that there were 1 billion obese people in the world in 2022, and that obesity rates have doubled among adults since 1990 and quadrupled among children and adolescents [2]. The problem is expected to get even worse in the future: the World Obesity Federation projects that 54% of adults will be overweight or obese by 2035, up from 42% in 2020 [3].

The rapidly growing prevalence of OAO has both health and economic consequences. There are over 5 million deaths each year from non-communicable diseases that are attributable to OAO, including cardiovascular diseases, cancer, Alzheimer's disease, and diabetes. Such risks also hold for some communicable diseases, such as in the case of COVID recently. A recent study estimated the economic impact of OAO in 2019 at 2.29% of global gross domestic product, which amounts to about \$2 trillion [4]. The World Obesity Federation predicted this cost would surpass \$4 trillion by 2035 [3].

To address the OAO crisis, it is essential to understand its causes. While obesity is complex and multiply determined, overnutrition is the single most important factor. This is well-summarised by a 2012 editorial in the *Journal of the American Medical Association*, which concluded that, “Obesity results from overnutrition and the primary therapeutic target is preventing or reversing overeating.... Exercise is associated with weight loss but its duration or intensity has minor effects on weight loss relative to diet” [5]. Simply put, eating too much, typically by over-consuming “empty calories” from food that has low nutritional value, causes weight gain. Exercise is of course beneficial for health in many ways, but, compared to diet, is relatively less instrumental for weight loss [6].

LAYPEOPLE'S BELIEFS ABOUT OBESITY

While medical science now agrees that poor diet is the primary cause of obesity, our research focuses on laypeople's understanding. In 2013, we reported on surveys we conducted in Canada, France, Hong Kong, South Korea, and the United States. Across these diverse locations, we consistently found that equal proportions of laypeople named poor diet and lack of exercise as the primary cause of obesity. Other factors, such as genetics and a range of second-order influences, were mentioned relatively sporadically and much less frequently than these two main factors [7].

Unfortunately, these misbeliefs are associated with unfavorable consequences. People who believed obesity is caused primarily by lack of exercise had significantly higher body mass

index (BMI) than those who attributed it to poor diet. For instance, in the South Korean sample, the “diet theorists” had a mean BMI of 21.55 whereas the mean for “exercise theorists” was 23.10, which exceeds the South Korean government’s threshold for overweight (BMI 23). This difference corresponds to over four kilograms in weight for a South Korean of average height – not an insignificant amount. The patterns were the same everywhere, even after accounting for other factors known to affect BMI, such as medical conditions, sleep deprivation, education, residential location, and stress. The evidence is cross-sectional, and BMI as an indicator is informative but has limitations, but we observed similar differences in several countries. Moreover, we demonstrated using experimental methods that “exercise theorists” were indeed likely to have larger intake quantities than “diet theorists”.

These differences can be explained by much research in psychology showing that people’s beliefs guide their actions [8, 9]. People who believe overeating primarily causes obesity tend to monitor the quality and quantity of their eating; those who believe lack of exercise causes obesity are less likely to do so. The effects of these misbeliefs are compounded by the fact that people generally overestimate how many calories they burn while exercising, and also underestimate their caloric intake [9]. Furthermore, people sometimes reward themselves for exercising, and in so doing ironically consume more calories than they had burned.

LEANWASHING

Why is half the population misinformed about bad diet being the primary cause of obesity? We attribute this at least in part to what we call ‘leanwashing’ by the food and beverage industry [10]. ‘Greenwashing’ is a term derisively used to describe the public relations and marketing activities of a firm to deceptively promote the perception that the firm is environmentally responsible. Likewise, ‘leanwashing’ refers to the public relations and marketing activities of a firm that promote the perception that the firm is helping to solve the obesity problem, and to deflect attention from the fact that it might actually be contributing to the obesity crisis.

In 2014, we analysed food companies’ messaging related to obesity, across four categories: public statements, lobbying, philanthropy, and sponsorships of sports teams and events (i.e., messages not intended to advertise a specific food or beverage). Our research found that the industry’s messaging has been consistently and overwhelmingly focused on either exercise or a “balanced” lifestyle. For example, summarising the consistency in public messaging, the websites of some major corporations revealed the following phrases – ‘active balanced lifestyle’: Coca Cola; ‘balanced active lifestyle’: McDonald’s; ‘balanced and healthy lifestyle’: General Mills; ‘balanced diet and lifestyle’: Unilever; ‘well-balanced lifestyle’: Mars; ‘a balanced lifestyle’: Nestle, PepsiCo. The role of poor diet as a cause of obesity, leave alone the primary cause, was conspicuous by its absence.

This consistency is also evident on the lobbying front. For example, the Center for Consumer Freedom (CCF), a nonprofit “lobbying front for the restaurant, food, beverage, and alcohol industries” stated (in a paper titled ‘An Epidemic of Obesity Myths’) that “A hefty number of studies has shown that the trend of rising obesity rates can be attributed not to increased intake of food in general (or any particular food) or to the influence of restaurants, but rather to less physical activity compounded by a variety of other factors that are constantly being explored” [10]. As is evident, this message directly contradicts the JAMA editorial [5].

Moreover, the same paper also affirmed that “A calorie is a calorie” – a keystone of the “balance” philosophy that is questioned by much medical research. In 2017, we tested the effects of holding such beliefs. We found that (American) people who simultaneously hold both beliefs promoted by the food industry, namely, the exercise theory and “a calorie is a calorie”, were likely to present with significantly greater BMIs (the group mean was nearly 30) than people who disbelieved either one or both of these messages (these group means were all approximately 25) [11].

Our analysis of corporate philanthropy and sports sponsorships revealed that almost every major sports competition and team that has a global following also has a major food company as sponsor. Food companies help build and renovate neighbourhood parks, playgrounds, and fitness centres, and launch initiatives called “Get In Step” and “Get The Ball Rolling”. Indeed, in 2015, *The New York Times* revealed that Coca-Cola had paid researchers to deflect attributions for obesity away from poor diet to insufficient exercise [12].

The most apt summary of the role of this industry comes from Indra Nooyi, the former CEO of Pepsico. Responding to a question about her firm’s role in the obesity crisis, she highlighted the fact that children nowadays play at home on their screens rather than going outdoors – “lifestyles have changed” [13]. As she said, encapsulating leanwashing, “If all consumers exercised, did what they have to do, the obesity crisis wouldn’t exist” [14]. This is the key point – the food and beverage industry almost always argues in terms of personal choice and the role of exercise, even if science points to the role of diet and more systemic causes.

THE OBESITY CRISIS AS MARKET FAILURE

The fact that this happens – that people hold misbeliefs which are consequential to their health, the public exchequer, and society as a whole – indicates that there is a ‘market failure’ in the food and beverage industry [15]. As we and others have found, adults do not have full information or understanding about the foods they eat or about the causes of obesity (due to leanwashing and other reasons). Moreover, children, who are a major target of food marketing, clearly are not capable of making rational and farsighted decisions about food. Economists refer to such gaps in knowledge between producers and consumers as “asymmetric information”, and this is a significant cause of market failure. Another cause of market failure is the fact that the costs of obesity are not proportionately borne by either the relevant firms or the consumers, and instead are imposed on the taxpayers (in the case of government financed health care) or other people in the health insurance pool. When such market failure occurs, the dogma of “free choice” – of people simply not “doing what they should be doing” – ceases to be applicable.

The responsibility (and costs) in such cases shifts from the individual to the society. Research documents four potential mechanism to correct market failure: industry self-regulation, corporate social responsibility (CSR), consumer social activism, and government regulation [16]. Our analysis shows that each of CSR, industry self-regulation, or social activism are probably not sufficient to correct the market failure in the food and beverage market [15]. Thus, government intervention is required for a meaningful reduction in the prevalence of obesity [15, 17]. This is consistent with the recent heightened awareness across domains that individual change has a low ceiling in its effectiveness, and that government policy changes are needed for more powerful effects [18].

In Western democracies, government intervention is usually not possible without public support. Therefore, improved awareness and education is part of the solution. Restrictions on marketing actions, such as regulating advertisements, banning certain products, or restricting their access are likely to be effective but need broad-based support. The British government launched the sugar reduction programme in 2016 “and set an ambition for all sectors of the food industry to voluntarily reduce sugar by 20% by 2020 in the food categories that contribute most to the intakes of children aged up to 18 years.” The results have been positive but have not achieved the ambitious targets: overall there was a 3.5% reduction in the sales weighted average total sugar per 100g between 2015 and 2020 for branded food products, and a 0.2% reduction for ‘out of home sector’ products [19]. We believe that a mandatory programme (such as regulations and taxes) would be more effective than a voluntary programme.

Taxation is another possible set of actions that can be effective but need public support. Products such as alcohol and tobacco are taxed in many jurisdictions, some more heavily than others. Since refined carbohydrates are a factor in weight gain, a possibility is to impose a tax on sugar itself, or on products containing sugar; the most common example in practice has been a tax on sugary drinks. This shift in favour of sugar taxes is due to a swing in both scientific and public opinion, as reflected by a World Health Organisation study urging all countries to tax sugary drinks [20]. The study concluded that “there is a reasonable and increasing evidence that appropriately designed taxes on sugar-sweetened beverages would result in proportional reductions in consumption, especially if aimed at raising the retail price by 20% or more.” Moreover, revenues raised from such taxes would help buffer the public medical system. The British government implemented a Soft Drinks Industry Levy in 2018 in a 3-tier system: 1) no tax on drinks with sugar content of less than 5g per 100ml, 2) ‘standard rate’ (18p per litre) tax on drinks with sugar content between 5g and 8g per 100ml, and 3) ‘higher rate’ (24p per litre) for drinks with sugar content more than 8g per 100ml. This levy has been effective as the sales weighted average total sugar content fell from 3.8g per 100ml in 2015 to 2.2g per 100ml in 2020, which is a decrease of 46% [19]. In Mexico the government implemented a tax of one Mexican peso per litre on sugar-sweetened beverages. There was a statistically significant purchase reduction for middle-price sugar-sweetened beverages after the tax implementation; but not for purchases of low-price and high-price beverages, which together account for 70% of the sugar-sweetened beverage sector [21]. Comparing the two, it appears that the British levy may have been more effective both because the Mexican tax appears to be lower (i.e., about 4p per litre, whereas the British tax is 18-24p per litre; for an accurate comparison these need to be indexed to the local prices per litre), and also is linked to sugar content. Evidently, taxes and tariffs can work, but it is important to design them appropriately. Understanding the local public appetite for different structures of taxation is a necessary precursor to such design.

Finally, the growing prevalence of OAO among children needs urgent intervention. Actions aimed at children, such as restricting marketing of unhealthy foods, have empirical support and should be part of policy actions. Historically, proposed restrictions are often met with initial resistance on (specious) grounds of “freedom”, but later work their way into enforcement. The parallels between the current debate on OAO and the trajectory of the more mature discourse on smoking is informative [22]. At the time of writing, the UK government’s Tobacco and Vapes Bill proposes to ban sales of tobacco products to children born in or after 2009 – a measure that has gained support across political lines including from self-identified libertarians. Such measures should be on the OAO table as well.

IMPLICATIONS FOR HEALTH CARE PROFESSIONALS

Some people, especially in market-oriented countries, believe that the free market and private enterprise will address the obesity crisis. The Nobel Prize winning economists George Akerlof and Robert Shiller caution against such naïve views [23]. Moreover, and for many reasons, most governments have been slow to implement public policies to restrain the food and beverage industry. Independent of government (in)actions, however, we believe that leaders in public health organisations and health delivery organisations, and clinicians, can and should guide public opinion to address the obesity problem. In our view, their roles are complementary and mutually reinforcing: the role of leadership is to make structural changes to the food environment and discourse, while front-line clinicians are well placed to sway the narrative in conversations with laypeople. Both fronts are necessary for public misinformation to be rectified and opinions formed based on scientific fact – thereby creating the bases for the sorts of systemic change discussed above.

Leadership

Leaders of public health organisations should engage in a vigorous long-term campaign to educate the public about the causes and consequences of obesity. The leaders should directly and explicitly take on the food and beverage industry. For example, when someone claims that the obesity crisis would not exist if people exercised more, these leaders should explicitly and visibly contradict such a statement. In this vein, Dr. Tom Frieden, former Director of the Centers for Disease Control and Prevention has publicly criticized the marketing practices of food and beverage companies and supported policies like soda taxes and improved food labelling [24]. A public debate would better inform the general population. The leaders should also lobby with the government and the legislature to appropriately regulate the food and beverage industry, including ingredient or product limitations or bans, limitations on advertising to children, and the importance of high quality food in schools. The medical community has allowed the narrative to be shaped by monied interests in the private sector for too long.

While the effectiveness of any actions taken to influence external parties depends on many factors, the leadership of medical organisations has considerably greater freedom in implementing policies and practices internally to these organisations. For example, it is striking that the nutritional environment in many medical facilities is poor [25, 26], with hospitals often selling the same kinds of junk food that medicine is supposed to be steering patients away from. Food contracts at cafeterias and canteens are often tendered out to the lowest bidder, rather than one who will provide the nutritional outcomes that federal guidelines actually recommend. People tend to eat what is available in the moment (rather than what they know they should); yet hospital waiting rooms feature vending machines stocked with sugary drinks and high-calorie, low-nutrition snacks. Thus, the overall environment is one where the available foods are nutrient-poor, and dietary messaging is close to non-existent. Poor nutrition is not only a concern for patients, as more than half of NHS staff are OAO themselves [25].

While medical leadership has on occasion attempted to combat poor nutrition [27], it is also possible to take concrete steps to counteract leanwashing messages specifically. A calorie is *not* just a calorie, and poor diet *can* have serious consequences. Less (visual of junk food and

sugary beverages) is more (visual of health and life). It should be straightforward to develop messaging campaigns driving these simple points home and display these prominently on the expanses of waiting room walls where people spend countless hours, sitting with health concerns front and centre. The financial resources of health administrators pale before the advertising budgets of the food industry, but assets such as source credibility, consumers' attention, and potential for two-way communication are not inconsequential and should be leveraged.

Front-line care

Relevant to the last point, medical school curricula often do not adequately teach about helping patients with nutrition and holistic health. Consequently, many front-line physicians are not well trained to address obesity [28]. That said, physicians in our sample were significantly more likely to (correctly) believe that obesity is driven to a relatively greater degree by food intake. Our sample was admittedly drawn from a single, American, hospital, but we would like to believe that medical professionals do indeed have the right information – they just need to disseminate it more than most currently do. Physicians are a trustworthy and influential source of health information to patients, and hence if they were more active in communicating this to patients, it would go a long way.

However, research shows that clinicians do not like to talk about weight with their patients, citing discomfort, and OAO patients do not like to talk about their weight with physicians [29]. There are systematic biases and discrimination (both conscious and nonconscious) that affect the treatment that OAO receive [30, 31]. And if they receive poor treatment, they are less likely to visit a doctor again for care or commit to the recommendations provided [32, 33]. Those making decisions for front line care in health delivery organisations need to ensure that physicians and clinicians working in their organisations are trained to and do address the potential onset of OAO. This could include short training modules on evidence-based nutrition, OAO causes, weight stigma, and how to communicate with diverse patients.

Western medicine tends to focus on curative versus preventative solutions, and time pressures to “turn over” patients quickly may result in OAO not being prevented, but rather on being treated too late. Clinicians should adopt a triage approach: patients with normal weight, patients who are (or becoming) overweight and maybe on a path to obesity, and patients who are obese. Clinicians should inform and educate patients with normal weight about healthful habits to avoid becoming overweight. Patients who are (or becoming) overweight need more and better targeted attention. Besides education, they may need counselling, intervention, and/ or group therapy to return to normal weight. Patients who are already obese may, in addition, need significant medical intervention such as surgery or drugs (such as GLP-1 agonists).

CONCLUSION

OAO is complex and multifaceted, and the discourse matters as it affects population beliefs and actions. The extremes can have negative consequences. For example, if one believes that obesity is a disease that is uncontrollable, then it is external to the self and both personal responsibility and individual choices matter little. This means that motivation to address OAO (both from a patient and clinician perspective) is low, which is undesirable. However, a narrative that obesity is something within full personal responsibility puts the blame on

patients fully, ignores the important social determinants of health, causes OAO patients to avoid seeking care, be refused proper treatment, and generally receive poorer care from medical professionals.

Our research focuses on laypeople's beliefs and how these have been leanwashed by corporate messaging. Not only do such misplaced beliefs have adverse consequences for the individual holding them, they also have intergenerational consequences [34]. Our message is relevant across silos in medicine, surgery, and public health – it applies to the whole human. Consequently, we hope that evidence-based discourse in the form of informed perspectives and expert outreach can extend from the healthcare community to the general population, for improved health outcomes for all concerned.

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CONFLICT OF INTEREST

Aneel Karnani, Brent McFerran, and Anirban Mukhopadhyay declare that they have no conflict of interest.

CONTRIBUTIONS

Aneel Karnani, Brent McFerran, and Anirban Mukhopadhyay jointly wrote this manuscript.

INFORMED CONSENT

All reported studies/experiments with human participants performed by the authors have been previously published. All reported studies/experiments complied with all applicable standards for informed consent (including the Helsinki declaration and its amendments, institutional/national research committee standards, and international/national/institutional guidelines).

ETHICS APPROVAL

All reported studies/experiments with human participants performed by the authors have been previously published. All reported studies/experiments complied with all applicable ethical standards (including the Helsinki declaration and its amendments, institutional/national research committee standards, and international/national/institutional guidelines).

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