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Research Article

The calorie-burning myth: Examining sugar companies' influence in obesity science and sports.

Anup Bhaskarrao Chaudhary[1], and Abhinav Vitthalrao Pathare[2]
[1]Director & Chief Nutrition Advisor, Public Health India (PHI), Mumbai, India.
[1]Senior Lecturer in Nutrition Sciences, India.
[2]Master of Science in Applied Public Health, The University of Central Lancashire (UCLan), England.
[2]Principal Investigator, Public Health India (PHI), Mumbai, India.

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***Corresponding author:** Anup Bhaskarrao Chaudhary, anup@publichealthindia.com, +91 9518580181.

Abstract: The authors highlight Big Sugar's powerful and multidimensional influence in the obesity science and sports sector. The term Big Sugar encapsulates a group of major producers/manufacturers of sugar and related products. The authors investigate how companies like PepsiCo, Coca-Cola, Cadbury, and McDonald's provide massive and longstanding financial sponsorships to famous sports events such as the Olympic Games, Commonwealth Games, and Indian Premier League (IPL). Big Sugar aggressively promotes the notion that consuming sugary products is benign as long as the individual exercises to expend (burn) an equivalent number of calories consumed. However, the authors suggest that this calorie-burning notion is misleading and incorrect. The authors present scientific evidence suggesting that exercise cannot outrun the adverse effects of sugar calories. The human body metabolises different calories—from carbohydrates (sugars), proteins, and dietary fats—in different ways. Calories originating from carbohydrates/sugars promote insulin secretion, body-fat accumulation and appetite. Moreover, the authors discuss how Big Sugar has a massive financial influence on healthcare research, policies, and communication and how Big Sugar perpetuates misleading concepts to prioritise profit over public health. This urgent issue is evident in the pattern that even the physically active population is suffering from obesity, diabetes, and metabolic disorders, likely due to misleading concepts such as burning sugar calories by exercising. Moreover, the authors suggest that public health policymakers should encourage manufacturers to reduce products' sweetness so consumers may reduce their pleasure threshold. Ultimately, the authors propose the Whole System Approach to mitigate Big Sugar's vested interest and conflicts of interest. Offering hope for India's healthier future, the authors stress the importance of establishing robust collaboration between researchers/scientists, healthcare providers and councils, sports agencies, public health authorities/organisations, policymakers, non-governmental organisations, educational institutes, advocacy groups, and regulatory bodies.

Keywords: Olympic Games, Commonwealth Games, Indian Premier League, IPL, Big Sugar, Obesity Science, Sports, PepsiCo, Coca-Cola, Cadbury, McDonald's, Public Health, Diabetes, Metabolic Health, Whole System Approach, Collaborative Approach.

1) MAIN BODY OF THE ARTICLE

Big Sugar (a group of major sugar companies) chronically influences the world of sports. For instance, in India, as reported by KG (2015) [8], PepsiCo paid the Board of Control for Cricket in India (BCCI) Rs 396 crore to buy the title rights of the Indian Premier League (IPL) for five years (starting in 2013). This amount was double the amount paid by the previous title sponsor, Delhi Land and Finance (DLF), India's one of the most prominent commercial real estate firms. According to Kumar, Sharma, and Pal (2021) [9], the Indian Premier League (IPL) is the most popular cricket league in the world, with a viewership of over 400 million on both TV and Over-The-Top (OTT) platforms (Kamath, Ganguli, George, and Vibha, 2020) [7]. Moreover, for 41 years, McDonald's was one of the top sponsors of the Olympic Games (Reuters, 2017) [20]. Furthermore, Coca-Cola is a proud and longest-standing partner of Olympic Movement and has sponsored Olympic Games' every edition since 1928 (International Olympic Committee [IOC], 2024) [6].

After sponsoring the Sydney Olympics in 2000 and the Commonwealth Games held in Manchester and Melbourne in 2002 and 2006, respectively, Cadbury approached the London Olympics 2012 for providing sponsorship (Sweney, 2008) [25]. Although the National Obesity Forum (NOF) has objected that Cadbury is a confectionery company and so it is inappropriate for the sports and fitness sector (Halliday, 2008) [4], Cadbury succeeded in sponsoring the Olympics event. The clarification provided by the Cadbury's chief executive was that there is no harm in eating sweet food products unless an individual knows how to balance caloric intake with physical activity (Slater, 2008) [24], i.e., caloric expenditure.

Similarly, by funding public health research (Serodio, Ruskin, McKee, & Stuckler, 2020) [23], government organisations (Greenhalgh, 2019) [3], T.V. shows (Business Standard, 2013; Roehr, 2017) [2] [22], newspapers/releases (Aaron & Siegel, 2017; O'Connor, 2016; The Coca-Cola Company, 2013; Union of Concerned Scientists, 2017) [1] [10] [31] [32] and sports events, food giants like Coca-Cola and

PepsiCo have chronically reinforced this advice of eating what children want and balancing it with physical activity. For example, Coca-Cola—which spent an average of $ 4 billion/year over the last years on advertising (Ridder, 2024) [21]—promotes the idea that *"all calories count, no matter where they come from…"* (Hsu, 2013, Para. 18) [5]. Coca-Cola links its products with sports, implying that consuming its products (beverages) is acceptable as long as the consumer exercises. For instance, as reported by Hsu (2013) [5], the following is the quote by Coca-Cola: *"...if you eat and drink more calories than you burn off, you'll gain weight"* (Para. 18). Additionally, as again reported by Hsu (2013) [5], Coca-Cola promotes the concept of "all calories count" as a *"…simple common-sense fact"* (Para. 18). Scientific evidence, however, suggests that this concept is deceptive, misleading and incorrect (Pathare, 2021a) [12].

The human body metabolises different types of calories in dramatically different ways. Carbohydrate calories tend to raise insulin and, in effect, may put the body immediately into fat storage mode (Taubes, 2007, 2011, 2017, 2020, 2024) [26] [27] [28] [29] [30]. It is vital to take the calories' source—i.e., the quality of calories—into consideration. Calories originating from carbohydrates (or sugars) promote the accumulation of body-fat as well as increase the appetite. Calories originating from dietary fats, on the other hand, induce fullness and satiation, and likely does not promote body-fat accumulation.

The public health implications of the above-discussed carbohydrate-insulin model of obesity are enormous, suggesting that carbohydrate consumption in children, athletes, and the general population, may not necessarily be compensated by energy expenditure. This discussion may help health authorities understand why even the physically active population suffers from obesity, diabetes and metabolic disorders.

Another important public health implication that the health authorities should comprehend from this article is that Big Sugar's rationale behind influencing research, policy departments, sports, and other relevant sectors goes beyond just advertising their products. These companies seem to be more interested in allowing misconceptions to persist in society and also in the professional and scientific community. For example, among two bits of advice (i.e., "low-carbohydrate" and "low-calorie"), the sugar industry may likely prefer to promote the "low-calorie" advice because doing so will still allow them to sell their sugary products by advocating moderation and caloric-balance as a personal responsibility. On the other hand, "low-carbohydrate" advice (without caloric restriction), despite being significantly effective in solving obesity and several metabolic syndromes, likely may not be preferred to be promoted by the sugar industry because doing so may significantly reduce their (sugar-dependent) income.

Increasing numbers of food product manufacturers are coming up with artificially sweetened products as an alternative to sugary products. However, among the numerous addictive properties of sugar, the sweet taste is one of the dominant ones. Therefore, rather than just replacing sugar with artificial sweeteners, which still provoke the sensation of pleasure, it would be far more helpful for public health policymakers to encourage the food product manufacturers to curtail the products' overall sweetness so that the consumers (especially children) will eventually reduce the threshold of pleasure.

However, all these necessary changes are likely only possible by ending Big Sugar's vested interest and conflict of interest. However, pragmatically, putting such interest to a complete end (a systemic change) is undoubtedly challenging because many parts or aspects are usually interrelated, such as—but not limited to—capitalisation, economy, longstanding beliefs, and cultural limitations. Therefore, putting health at the system's heart is an admiringly intricate task—this is true for both developing and developed countries. Nevertheless, these challenges, at least to some extent, can be mitigated by employing a Whole System Approach.

A Whole System Approach in public health is a collaborative approach to establish a synergy between broader departments/stakeholders to promote and prioritise "health for all" (Pathare, 2021b) [13]. In light of this article's topic, these departments/stakeholders (among whom the synergy is required) would be—but not limited to—researchers and scientists, healthcare providers and councils, private and government sports agencies, public health authorities and organisations, policymakers, non-governmental organisations, educational institutes, advocacy groups, and government regulatory bodies (responsible for regulating areas such as—but not limited to—advertisements, health communication, and research fund allocation). Figure 1 represents the model that we (the authors of this article) have developed. This model is a framework that identifies the most relevant stakeholders who need to collaborate to curb Big Sugar's influence in sports. Implementing this model has the robust potential to help communicate correct information and, in effect, improve public health outcomes. Therefore, by employing a Whole System Approach, collaborative efforts to tailor public health strategies aimed at reducing Big Sugar's influence in obesity science and sports are urgently needed.

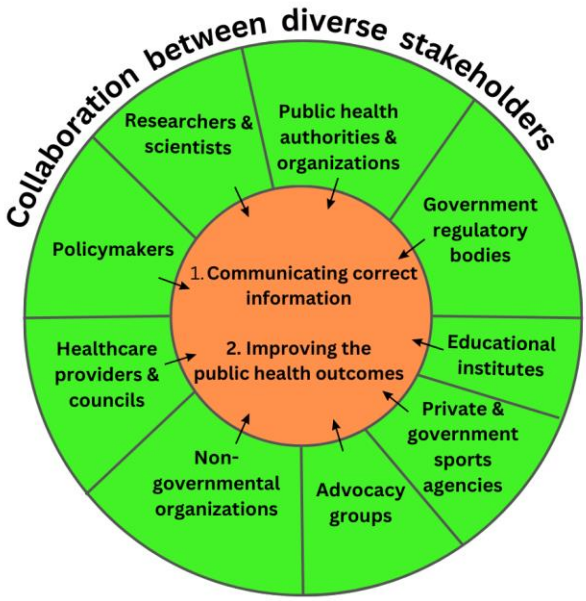

Figure 1: Model for curbing the Big Sugar's influence in sports. Proposed by/in Chaudhary and Pathare (2024).

2) CONCLUSION

The powerful and longstanding influence of Big Sugar in obesity science and sports is a noteworthy public health issue. By providing substantial financial sponsorships to renowned sports events—such as the Olympic Games, Commonwealth Games, and Indian Premier League (IPL)—companies like PepsiCo, Coca-Cola, Cadbury, and McDonald's seem to be aggressively promoting the notion that consuming sugary products is harmless provided that the individual exercises to spend (burn) an equivalent amount of calories. However, a robust body of scientific evidence suggests this calorie-burning notion is misleading and incorrect.

The human diet has three primary sources of calories: carbohydrates, proteins, and dietary fats, and the body metabolises each type of calorie differently. Evidence suggests that the consumption of carbohydrates (or sugars) facilitates the accumulation of body-fat and increases appetite. Conversely, dietary fat calories induce fullness and satiation and likely do not facilitate the accumulation of body-fat. Exercise cannot be used merely as a calorie-burning tool to outrun the harmful effects of sugar (carbohydrates) calories. Therefore, it is essential to focus on the quality (source) of the calories rather than just focusing on the quantity.

However, by exerting considerable financial influence on healthcare research, policies, and health communication, Big Sugar seems to contribute to perpetuating the flawed concept of calorie-burning. This may be one of the reasons why obesity, diabetes, and metabolic disorders are evident even in physically active individuals. In order to mitigate Big Sugar's vested interest and conflict of interest, a robust collaboration between diverse stakeholders should be established using the Whole System Approach. These stakeholders could be—but not limited to—as follows: government regulatory bodies, advocacy groups, non-governmental organisations, private and government sports agencies, healthcare providers and councils, researchers and scientists, public health authorities and organisations, educational institutes, and policymakers.

Moreover, instead of simply replacing sugar with artificial sweeteners, public health policies should encourage manufacturers to reduce the overall sweetness of their products. This reformulation of the products may help reduce the pleasure threshold of consumers (especially children). Finally, implementing the recommendations suggested in this article requires coordinated efforts among all the stakeholders. Therefore, we all must unite to prioritise "enhanced public health outcomes" over the "profits of Big Sugar."

3) ABOUT AUTHORS

3.1) About Anup Bhaskarrao Chaudhary

Anup Bhaskarrao Chaudhary is an Indian researcher in nutrition sciences. He has published multiple research papers in scholarly journals (Pathare & Chaudhary, 2022a, 2022b, 2024a, 2024b) [16] [17] [18] [19]. Anup is also the Founding Director of Public Health India (PHI), an Indian health advocacy organisation, and a consultant nutritionist who helps a wide range of populations improve metabolic health and quality of life.

Anup aims to bring India-specific low-carbohydrate data into the literature to help public health researchers, mainstream health professionals, and health organisations make informed decisions in designing and improving treatment strategies for better metabolic outcomes in the members of the public.

3.2) About Abhinav Vitthalrao Pathare

Abhinav Vitthalrao Pathare is a public health researcher from India. In 2020, he received a Master of Science in

Applied Public Health from the University of Central Lancashire (UCLan), England, with merit classification. His master's thesis focused on facilitating low-carbohydrate policies in the United Kingdom's National Dietary Guidelines (NDGs) and received distinction. He serves as a Principal Investigator in low-carbohydrate-related contemporary research projects.

Abhinav has written multiple journal articles and editorials on various public health and medical topics (Pathare & Chaudhary, 2022a, 2022b, 2024a, 2024b; Pathare, 2021a, 2021b, 2022, 2023a, 2023b) [16] [17] [18] [19] [12] [13] [11] [14] [15]. Abhinav aims to improve public health outcomes through informed policies, strategies, interventions, and communication techniques. He advocates the Whole System Approach for facilitating low-carbohydrate-supportive policies, encouraging the interdisciplinary and collaborative approach.

4) AUTHORS' CONTRIBUTIONS

Both authors contributed equally to this manuscript. Both authors were involved in carefully proofreading the content, and both of them approved the manuscript for publication.

5) AUTHORS' ORCID iDs

Abhinav Vitthalrao Pathare: https://orcid.org/0000-0003-4811-0121
Anup Bhaskarrao Chaudhary: https://orcid.org/0000-0003-0035-1436

6) CONFLICT OF INTEREST

There is no conflict of interest.

7) DEDICATION STATEMENT

7.1) By Anup Bhaskarrao Chaudhary

I dedicate this article to Vivek Singh Rajput, a senior nutrition and exercise sciences lecturer in India. He has substantial experience mentoring many coaches and nutritionists across India. I have known him personally since 2020, when I began my journey as a sports nutrition student.

The Indian sports industry primarily revolves around the conventional wisdom (high-carbohydrate diets). However, Vivek Singh Rajput's lecture on applying the Low-Carbohydrate High-Fat (LCHF) approach in sports has changed my thought process and ignited my interest. He has always supported and encouraged me throughout my journey as a student and now a senior lecturer in sports nutrition. Therefore, this dedication statement is my gesture to express my gratitude towards Vivek Singh Rajput.

7.2) By Abhinav Vitthalrao Pathare

I dedicate this article to Shweta Bhatia, a registered dietitian from India (recognised by the Indian Dietetic Association). She has extensive experience applying the Low-Carbohydrate High-Fat (LCHF) approach in clinical cases and sports nutrition. I have known her personally since I published my academic article, *"Exercise does not solve obesity: The calorie-burning theory is misleading and incorrect"*, in 2021 [12].

While my above-mentioned article sparked considerable debates (locally and internationally), Shweta Bhatia actively supported my scientific arguments in light of the LCHF approach. This encouraged me to keep writing further articles. Therefore, this dedication statement is my gesture to express my gratitude towards Shweta Bhatia.

7.3) Disclaimer regarding the dedication statement

The responsibility for all the contents of this manuscript is solely borne by the authors and not by any other individuals or organisations. Therefore, the dedicatee(s) mentioned in the dedication statements are not associated with—or responsible for—any aspect/content of this article or its publication. The dedication statements are intended purely to express appreciation and do not imply any endorsement or involvement of the dedicatee(s) in the content or conclusion of this article.

8) A TRIBUTE TO INDIA'S OLYMPIC AND PARALYMPIC ATHLETES

As we were working on this article, the 2024 Olympic and Paralympic Games in Paris were ongoing. This article pays tribute to the athletes who represented India in these games. Their relentless efforts, remarkable victories, and incredible comebacks are encouraging the Indian public across all age groups.

Due to their robust influence and credibility, these athletes have the power to impact the public's lifestyle behaviour. Therefore, we commend these role models, who are among the most paramount stakeholders in shaping the lifestyle choices of the Indian public..

9) REFERENCES

1. Aaron, D. G., & Siegel, M. B. (2017). Sponsorship of national health organizations by two major soda companies. *American journal of preventive medicine*, *52*(1), 20-30. https://doi.org/10.1016/j.amepre.2016.08.010
2. Business Standard. (2013). '*Misleading' Coke ad banned.* Retrieved from https://www.business-standard.com/article/news-ani/misleading-coke-ad-banned-113071900402_1.html
3. Greenhalgh, S. (2019). Soda industry influence on obesity science and policy in China. *Journal of Public Health Policy*, *40*(1), 5-16. https://doi.org/10.1057/s41271-018-00158-x
4. Halliday, J. (2008). *Cadbury's Olympic game draws criticism from campaigners*. Retrieved 2020, from https://www.foodnavigator.com/Article/2008/10/21/Cadbury-s-Olympic-game-draws-criticism-from-campaigners
5. Hsu, T. (2013*). Coca-Cola addresses obesity, defends itself in TV ad campaign*. Retrieved from https://www.latimes.com/business/la-xpm-2013-jan-15-la-fi-coca-cola-obesity-20130115-story.html
6. International Olympic Committee. (2024). *Coca-Cola & Mengniu.* Retrieved from https://olympics.com/ioc/partners/coca-cola-mengniu

7. Kamath, G. B., Ganguli, S., George, S., & Vibha. (2020). Fans' Attachment to Players in the Indian Premier League: Insights from Twitter Analytics. In *Re-imagining Diffusion and Adoption of Information Technology and Systems: A Continuing Conversation: IFIP WG 8.6 International Conference on Transfer and Diffusion of IT, TDIT 2020, Tiruchirappalli, India, December 18–19, 2020, Proceedings, Part II* (pp. 451-462). Springer International Publishing. 10.1007/978-3- 030-64861-9_40. https://inria.hal.science/hal-03744777/document
8. KG, M. R. (2015). Ambush Marketing-A Study with Special Reference to Indian Premier League 2013. *International Journal of Scientific and Research Publications*. Retrieved from https://www.ijsrp.org/research-paper-0515/ijsrp-p4148.pdf
9. Kumar, Y., Sharma, H., & Pal, R. (2021, September). Popularity Measuring and Prediction Mining of IPL Team Using Machine Learning. In *2021 9th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO)* (pp. 1-5). IEEE. https://doi.org/10.1109/ICRITO51393.2021.9596405
10. O'Connor, A. (2016). *Coke and Pepsi give millions to public health, then lobby against it.* Retrieved from https://www.nytimes.com/2016/10/10/well/eat/coke-and-pepsi-give-millions-to-public-health-then-lobby-against-it.html
11. Pathare, A. (2022). Mr Kaizzad Capadia: "The Science Protector" Like Dr Burwell from Harvard and Dr Sackett from Oxford University. *International Journal of Medical Science and Current Research*, *5*(1), 428-431. Retrieved from http://www.ijmscr.com/asset/images/uploads/16431823710447.pdf
12. Pathare, A. V. (2021a). Exercise Does Not Solve Obesity: The" Calorie-Burning Theory" Is Misleading And Incorrect. *International Journal Dental and Medical Sciences Research*, *3*(5), 328-333.Retrieved from http://clok.uclan.ac.uk/39920/ 1/39920%20AbhinavIJDMSR Article Editorial.pdf
13. Pathare, A. V. (2021b). Healthy Setting Approach: Origin, Evolution, and Development; Challenges and Opportunities in the University Setting. *International Journal of Medical Science and Current Research (IJMSCR)*, *4*(5), 1069-1080. https://clok.uclan.ac.uk/39919/1/39919%20HealthySettingAbhinavArticle.pdf
14. Pathare, A. V. (2023a). Medical interventions and their poor scientific backup: A threat to Evidence-Based Medicine. *International Journal of Advanced Research in Medicine*, *5*(2), 117-120. https://doi.org/10.22271/27069567.2023.v5.i2b.488
15. Pathare, A. V. (2023b). Improving the support for older adults in India: A multi-faceted approach for a better future. *International Journal of Paediatrics and Geriatrics*, *6*(2), 13-17. https://doi.org/10.33545/26643685.2023.v6.i2a.206
16. Pathare, A. V., & Chaudhary, A. B. (2022a). Contemporary directions in fatty liver disease in light of low-carbohydrate approach: a review by public health India. *European Journal of Molecular and Clinical Medicine*, *9*(2), 808–817. http://publichealthindia.com/wp-content/uploads/2022/04/Ejmcm-2263.1.pdf
17. Pathare, A. V., & Chaudhary, A. B. (2022b). War and public health: Relevancies and competencies explained by 'Public Health India'. *International Journal of Advanced Community Medicine*, *5*(3), 05-07. https://doi.org/10.33545/comed.2022.v5.i3a.240
18. Pathare, A. V., & Chaudhary, A. B. (2024a). 2.5-Month effects of a high-intensity low-carbohydrate intervention on glycemic and lipid profile: A type-2 diabetes near-to-remission case study of a 65-year-old Indian woman with recent bilateral knee replacement surgery. *Journal of population therapeutics and clinical pharmacology*. *31*(3), 1398-1415. https://doi.org/10.53555/jptcp.v31i3.5141
19. Pathare, A. V., & Chaudhary, A. B. (2024b). Remarks on Metabolic Health Conference 2024: In light of personal experience and scientific literature. *International Journal of Medical and Pharmaceutical Research. 5* (3), 65-68. 10.5281/zenodo.13219078. https://ijmpr.in/uploads/article/IJMPR-ASD-245007f.pdf
20. Reuters. (2017). *After 41 years, McDonald's ends Olympics sponsorship.* Retrieved from https://www.voanews.com/a/mcdonalds/3904331.html
21. Ridder, M. (2024). *Coca-Cola co.: Ad spend 2020 | Statista.* Retrieved from https://www.statista.com/statistics/286526/coca-cola-advertising-spending-worldwide/
22. Roehr B. (2017). Coca-Cola is sued over claims of misleading advertising. BMJ. 2017;356: j208. https://doi. org/10.1136/bmj.j208. https://www.bmj.com/content/356/bmj.j208
23. Serodio, P., Ruskin, G., McKee, M., & Stuckler, D. (2020). Evaluating Coca-Cola's attempts to influence public health 'in their own words': analysis of Coca-Cola emails with public health academics leading the Global Energy Balance Network. *Public Health Nutrition*, *23*(14), 2647-2653. https://doi.org/10.1017%2FS1368980020002098
24. Slater, M. (2008*). Bbc sport | Olympics | Olympic chiefs back Cadbury link.* Retrieved from http://news.bbc.co.uk/sport1/hi/olympic_games/7680158.stm
25. Sweney, M. (2008). *Olympic 2012 chief insists Cadbury is appropriate sponsor despite growing UK child obesity.* Retrieved from

https://www.theguardian.com/media/2008/oct/20/olympicsandthemedia-advertising

26. Taubes, G. (2007). *Good calories, bad calories*. Anchor.
27. Taubes, G. (2011). *Why we get fat and what to do about it*. Anchor.
28. Taubes, G. (2017). *The case against sugar*. Anchor.
29. Taubes, G. (2020). *The Case for Keto: The Truth about Low-Carb, High-Fat Eating*. Granta Books.
30. Taubes, G. (2024). *Rethinking Diabetes: What Science Reveals about Diet, Insulin, and Successful Treatments*. Knopf.
31. The Coca-Cola Company. (2013). *The Coca-Cola company reinforces its commitment to help America in the fight against obesity*. Retrieved from https://www.coca-colacompany.com/media-center/coca-cola-reinforces-commitment-to-help-in-fight-against-obesity
32. Union of Concerned Scientists. (2017). *How Coca-Cola disguised its influence on science about sugar and health.* Retrieved from https://www.ucsusa.org/resources/how-coca-cola-disguised-its-influence-science-about-sugar-and-health