Editorial

nutrition and health

Nutrition and Health
2026, Vol. 32(3) 729–731

DOI: 10.1177/02601060261446098
journals.sagepub.com/home/nah
Mary Ann Liebert
A Part of Sage

GLP-1 nutrition in the age of GLP-1s: When appetite shrinks but responsibility expands

Waqas Asghar[1], Komal Javed[1] and Nauman Khalid[2,3]

Obesity, the chronic, multifaceted, and relapsing ailment, remains a significant public health crisis worldwide and is a prime contributor to increased risk of non-communicable diseases (NCDs). Close to 74% of all deaths globally have been attributed to various NCDs such as diabetes, cardiovascular diseases (CVDs), cancers, and chronic respiratory diseases (CRDs) (Hildebrand and Pfeifer, 2025), while approximately 5 million fatalities per year have been directly attributed to overweight/obesity and higher than optimal body mass index (BMI) score (World Health Organization, 2026). In this context, pharmacological treatments are experiencing a significant surge in obesity management, owing to the fact that dietary and lifestyle changes alone often produce gradual and limited results (Qi et al., 2024). This pronounced shift, in particular, has been supported by growing insights into the biological processes that regulate appetite and energy balance (Ullah and Tamanna, 2025).

Various anti-obesity medications (AOMs) have demonstrated effectiveness in promoting weight loss, including orlistat, phentermine, combinations such as phentermine–topiramate and naltrexone–bupropion, as well as glucagon-like peptide-1 receptor agonists (GLP-1RAs), such as semaglutide (Ozempic/Wegovy), liraglutide (Victoza/Saxenda), and tirzepatide (Zepbound). Among these, GLP-1Ras, particularly, have yielded unprecedented results in the context of management of obesity, with many studies indicating 15% to 25% body weight loss, equating 2 to 3 times greater efficacy when compared to previous drug classes and lifestyle modifications (Qi et al., 2024). However, these therapies risk oversimplifying the narrative that the inherently complex physiological and behavioral phenomenon of appetite control, management of cravings, and weight loss is readily fixable. As the overweight/obesity management landscape is rapidly evolving, a key question arises: Does the role of nutrition become secondary to the pharmacological weight management strategies, or does it gain even more critical significance?

GLP-1RAs exert their effects through multiple coordinated physiological mechanisms. Primarily, they mimic the natural GLP-1 hormone (the key mediator of the incretin effect), thereby stimulating insulin release, reducing the secretion of glucagon, slowing down the gastric emptying, and enhancing satiety, leading to the cumulative effect of improved blood sugar control and reduced food intake (Zheng et al., 2024). These drugs also modulate brain pathways, directly targeting the reward centers (the mesolimbic system, including the nucleus accumbens and ventral tegmental region) located in the brain, as well as the appetite signaling pathways (by specifically targeting the arcuate nucleus area within the hypothalamus). This in turn downregulates the dopamine-driven food preoccupation, commonly termed as "food noise" (the constant and obsessive thoughts about food), and hedonic hunger, diminishing the cravings for highly palatable, high-calorie foods (Amorim Moreira Alves et al., 2025). Some recent trials also demonstrate the potential of these drugs in reducing the risk of major cardiovascular events (such as heart attacks and strokes), and treatment of major comorbidities, such as metabolic dysfunction-associated steatohepatitis (MASH), sleep apnea, and chronic kidney disease (CKD) (Gonzalez-Rellan and Drucker, 2025). From a clinical perspective, this satisfies what was intended: reduced caloric intake translating into weight loss, improving metabolic markers, and significantly reducing disease risk. However, this only implies that appetite has been engineered, while nutrition cannot be dealt with the same way.

It should be understood that medications like GLP-1RAs fail to discriminate between dietary patterns involving

[1]Department of Human Nutrition and Dietetics, School of Food and Agricultural Sciences, University of Management and Technology, Lahore, Pakistan
[2]Department of Food Science and Technology, School of Food and Agricultural Sciences, University of Management and Technology, Lahore, Pakistan
[3]College of Health Sciences, Abu Dhabi University, Abu Dhabi, United Arab Emirates

Corresponding author:
Nauman Khalid, Department of Food Science and Technology, School of Food and Agricultural Sciences, University of Management and Technology, Lahore 54000, Pakistan.
Emails: nauman.khalid@umt.edu.pk; nauman.khalid@adu.ac.ae

caloric-dense, nutrient-poor foods or those that are nutrient-dense. Neither can they promote adequate protein intake, nor, for that matter, safeguard against micronutrient deficiencies. Research studies indicate that the use of GLP-1RAs can lead to nutritional deficiencies in patients through alteration of gastrointestinal (GI) system physiology and inducing caloric restriction and appetite suppression (Kerlikowsky et al., 2025; Sibal et al., 2025). If food choices are not consciously managed, this could lead to poor protein intake, limited dietary diversity, and micronutrient deficiencies (Urbina et al., 2026). GLP-1RA therapy has also been associated with adverse side effects, including GI disturbances (diarrheal episodes, nausea, vomiting, abdominal pain), substantial loss of lean body mass (sarcopenia), reduced long-term adherence, weight regain upon discontinuation, as well as high costs (and consequent low cost-effectiveness) (Fitch et al., 2025). Furthermore, some studies also point to a shift in food preferences among patients on GLP-1 therapies, with a notable tendency toward consumption of minimally complex (and less nutrient-dense), and lighter foods, as well as development of aversions to certain flavors and textures (Bettadapura et al., 2025).

Such scenarios, therefore, underline the evolutionary and critical role of nutrition in patients on GLP-1RA therapies. Nutrition strategy in the management of obesity must shift from merely (traditional) caloric restriction to the balanced strategic approach of nutrient intake, such as protein intake that ultimately improves the lean body mass and satiety, along with ensuring micronutrient adequacy. Furthermore, GI tolerance becomes a critical consideration, as research indicates that complementary nutritional strategies can aid in the optimization of efficacy and tolerability of GLP-1RA therapies (Dias et al., 2025). Clinicians who prescribe GLP-1 medications for obesity should prioritize identifying and addressing these challenges by creating care plans that incorporate detailed nutrition and lifestyle guidance before, throughout, and after the weight-loss phase. This holistic approach can enhance outcomes beyond weight reduction, enabling clinicians to use GLP-1 therapies more responsibly while promoting patients' overall health and well-being (Mozaffarian et al., 2025). Overall, this paradigm reflects a shift beyond the traditional "eat less" method toward a more precise approach to optimize metabolic health, treatment adherence, and overall outcomes (Wilding et al., 2021).

Ultimately, GLP-1RAs can be regarded as a welcome and significant leap forward in the context of the treatment of obesity and metabolic disorders, offering renewed hope to individuals struggling with conventional approaches toward weight loss. Additionally, they have also emerged as a potent and effective new weapon for clinicians worldwide, aiming to address a highly persistent global health challenge. However, these therapies should be treated as powerful adjuncts (not replacements) to healthy habits, for addressing the challenges associated with lifestyle and nutrition interventions in the context of management of overweight/obesity, and NCDs. And, therefore, their success should not contribute to a shift away from the principles underpinning good nutrition. Instead, the wider integration of these drugs into clinical practice should be reinforced through robust strategic emphasis on dietary quality, consistent behavioral support mechanisms, and long-term sustainability.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

Amorim Moreira Alves G, Teranishi M, Teixeira de Castro Gonçalves Ortega AC, et al. (2025) Mechanisms of GLP-1 in modulating craving and addiction: Neurobiological and translational insights. *Medical Sciences (Basel, Switzerland)* 13(3): 136.

Bettadapura S, Dowling K, Jablon K, et al. (2025) Changes in food preferences and ingestive behaviors after glucagon-like peptide-1 analog treatment: Techniques and opportunities. *International Journal of Obesity (2005)* 49(3): 418–426.

Dias DD, Vasconcelos AR, Souza ACR, et al. (2025) Nutritional approaches to enhance GLP-1 analogue therapy in obesity: A narrative review. *Obesities* 5(4): 88.

Fitch A, Gigliotti L and Bays HE (2025) Application of nutrition interventions with GLP-1 based therapies: A narrative review of the challenges and solutions. *Obesity Pillars* 16: 100205.

Gonzalez-Rellan MJ and Drucker DJ (2025) The expanding benefits of GLP-1 medicines. *Cell Reports. Medicine* 6(7): 102214.

Hildebrand S and Pfeifer A (2025) The obesity pandemic and its impact on non-communicable disease burden. *Pflugers Archiv: European Journal of Physiology* 477(5): 657–668.

Kerlikowsky F, Krämer K, Eggersdorfer M, et al. (2025) GLP-1 receptor agonists—Good for body weight, bad for micronutrient status? *Current Developments in Nutrition* 9(11): 107587.

Mozaffarian D, Agarwal M, Aggarwal M, et al. (2025) Nutritional priorities to support GLP-1 therapy for obesity: A joint advisory from the American College of Lifestyle Medicine, the American Society for Nutrition, the Obesity Medicine Association, and The Obesity Society. *Obesity (Silver Spring, Md.)* 33(8): 1475–1503.

Qi QYD, Cox A, McNeil S, et al. (2024) Obesity medications: A narrative review of current and emerging agents. *Osteoarthritis and Cartilage Open* 6(2): 100472.

Sibal R, Balamurugan G, Langley J, et al. (2025) Macronutrient, micronutrient supplementation and monitoring for patients on

GLP-1 agonists: Can we learn from metabolic and bariatric surgery? *Nutrients* 17(23): 3659.

Ullah MI and Tamanna S (2025) Obesity: Clinical impact, pathophysiology, complications, and modern innovations in therapeutic strategies. *Medicines* 12(3): 19.

Urbina J, Salinas-Ruiz LE, Valenciano C, et al. (2026) Micronutrient and nutritional deficiencies associated with GLP-1 receptor agonist therapy: A narrative review. *Clinical Obesity* 16(1): e70070.

Wilding JPH, Batterham RL, Calanna S, et al. ; Step 1 Study Group (2021) Once-weekly semaglutide in adults with overweight or obesity. *The New England Journal of Medicine* 384(11): 989–1002.

World Health Organization (2026) *Obesity and Overweight*. Retrieved from https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight#:~:text=Common%20health%20consequences,of%20developing%20NCDs%20in%20adulthood. (Accessed on 10th April 2026).

Zheng Z, Zong Y, Ma Y, et al. (2024) Glucagon-like peptide-1 receptor: Mechanisms and advances in therapy. *Signal Transduction and Targeted Therapy* 9(1): Article 234.