International Journal of Innovative Technologies in Social Science

e-ISSN: 2544-9435

Operating Publisher
SciFormat Publishing Inc.
ISNI: 0000 0005 1449 8214

2734 17 Avenue SW,
Calgary, Alberta, T3E0A7,
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ARTICLE TITLE	TREATMENT METHODS FOR OBESITY IN ADULTS: ADVANTAGES AND DISADVANTAGES – LITERATURE REVIEW
DOI	https://doi.org/10.31435/ijitss.2(50).2026.5682
RECEIVED	26 February 2026
ACCEPTED	03 June 2026
PUBLISHED	11 June 2026
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TREATMENT METHODS FOR OBESITY IN ADULTS: ADVANTAGES AND DISADVANTAGES – LITERATURE REVIEW

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ABSTRACT

Background: Obesity is a growing public health crisis requiring timely intervention to prevent severe comorbidities (e.g., cardiovascular disease, type 2 diabetes) and improve patient survival.
Aim: To evaluate current obesity therapies—lifestyle modifications, pharmacotherapy, bariatric surgery, and experimental methods (FMT, DBS)—comparing their efficacy, complications, and required patient effort.
Materials and Methods: A targeted PubMed literature review using keywords such as "obesity treatment" and "bariatric surgery."
Results: Obesity has a multifactorial etiology. Lifestyle modifications are foundational but typically yield a modest weight loss of 5-10% and are limited by counter-regulatory mechanisms. Pharmacotherapy (e.g., GLP-1 receptor agonists) provides significant reduction (~20%), whereas bariatric surgery remains the most effective intervention for substantial, sustained weight loss and comorbidity remission.
Conclusion: Standalone lifestyle interventions are often insufficient due to high weight regain rates. Optimal long-term clinical outcomes require an individualized, integrated approach combining permanent behavioral changes with appropriate pharmacological or surgical therapies.

KEYWORDS

Obesity, Overweight, Bariatric Surgery, GLP-1 Receptor Agonists

CITATION

Dominika Karolak, Tymoteusz Białowąs, Natalia Sara Kuśmierowska, Monika Kuś, Grzegorz Słomkowski, Kacper Cholewiński, Daria Valipur Kolti, Milena Polak, Magdalena Natalia Nowak, Konrad Wiśniewski. (2026) Treatment Methods for Obesity in Adults: Advantages and Disadvantages – Literature Review. *International Journal of Innovative Technologies in Social Science*. 2(50). doi: 10.31435/ijitss.2(50).2026.5682

Introduction

The World Health Organization (WHO) defines overweight and obesity as abnormal or excessive fat accumulation that poses a risk to health.[1] The diagnosis is based on the body mass index (BMI), calculated as weight in kilograms divided by height in meters squared. Overweight is defined as a BMI of 25–29.9 kg/m², whereas obesity is diagnosed when BMI is ≥30 kg/m².[2] Although introduced in the 19th century by the Belgian mathematician and sociologist Adolphe Quetelet, BMI remains the primary indicator used to classify obesity, overweight, and underweight. [1] Obesity has become an increasingly prevalent global health problem affecting both adults and children. Current estimates indicate that approximately 650 million adults worldwide live with obesity, compared with 105 million in 1975. This dramatic increase highlights the urgency of addressing obesity and its associated complications.[1] Given its growing prevalence and the rising number of obesity-related comorbidities, recent decades have yielded substantial scientific interest and numerous studies dedicated to understanding and managing obesity. Obesity impacts nearly all aspects of health. Key complications include increased cardiovascular risk (hypertension, coronary artery disease, stroke), elevated incidence of malignancies, type 2 diabetes, obstructive sleep apnea, depression, and neurodegenerative diseases such as Alzheimer's and Parkinson's disease.[1], [3], [4]Obesity is a multifactorial condition influenced by genetic, economic, behavioral, and sociocultural determinants.[1] Understanding the underlying causes in each patient is essential for selecting the most effective therapeutic strategy.The aim of this review is to present current methods of obesity treatment and to discuss their advantages and limitations. The review encompasses lifestyle modification,pharmacotherapy, bariatric surgery, and experimental approaches that require further investigation before implementation in clinical practice.

Materials and methods

To evaluate the current therapeutic landscape of obesity management, a systematic literature search was performed, focusing on the integration of physical activity within various clinical interventions. PubMed served as the foundational bibliographic database, ensuring a wide-reaching analysis of both biomedical and psychological data. The search strategy utilized specific descriptors, including 'obesity treatment,' 'bariatric surgery,' and 'healthy lifestyle,' to isolate research regarding the efficacy of exercise as an adjunctive therapy. This methodological approach encompassed a broad spectrum of evidence—from clinical trials to observational studies—to synthesize current knowledge and highlight areas necessitating further investigation.

Diet and Regular Physical Activity

Lifestyle modification, including dietary interventions and increased energy expenditure, is fundamental in obesity management. Despite rapid development of other treatment modalities such as pharmacotherapy and bariatric surgery, lifestyle interventions remain the cornerstone of therapy.[4] Three dietary approaches are most commonly recommended: the Mediterranean diet, low-calorie diet, and low-carbohydrate diet. Clinical studies indicate that these diets demonstrate comparable effectiveness in weight reduction.[4] Regular physical activity is a crucial complementary component. A sedentary lifestyle is associated with reduced life expectancy and increased mortality among patients with chronic conditions such as hypertension, diabetes, coronary artery disease, and chronic obstructive pulmonary disease, particularly when accompanied by obesity. [5] Aerobic exercise—including walking, jogging, and running—has been shown to reduce blood pressure, improve lipid profiles, and enhance glycemic control. Resistance training additionally improves bone mineral density and increases muscle mass and strength.[5] Physical activity should be gradually intensified, with a recommended target of 200–300 minutes per week. Optimal outcomes are achieved when patients receive multidisciplinary support from dietitians, psychologists, nutrition therapists, and fitness professionals.[6] Lifestyle interventions alone typically result in a 5–10% reduction in body weight. [6] Some individuals may reach a “plateau” phase requiring adjunctive therapies, such as pharmacotherapy or bariatric surgery. Others may reach a metabolic “set point,” limiting further weight loss due to hormonal mechanisms involving increased hunger hormones and decreased satiety signals.[6]

Pharmacological Treatment GLP-1 Receptor Agonists

Initially introduced for the treatment of type 2 diabetes, GLP-1 receptor agonists are now widely used in obesity management due to their appetite-suppressing effects and influence on gastric emptying and satiety.[7] This class of drugs includes semaglutide, liraglutide, dulaglutide, albiglutide, exenatide, lixisenatide, and tirzepatide.GLP-1 secreted after meals controls glucose metabolism through different mechanisms: increase β-cell insulin secretion, reduce glucagon secretion, blunt gastric motility and emptying, decrease appetite, improve insulin sensitivity [8]Through these physiological mechanisms, GLP-1 receptor agonists contribute to substantial weight reduction. Clinical studies have demonstrated that this class of medications can induce weight loss of approximately 20%. The most effective agents identified to date include semaglutide and tirzepatide [9] However, this therapy must be continued long-term. Evidence indicates that a proportion of patients regain weight following discontinuation of treatment. Throughout the therapeutic process, lifestyle modification and dietary habit changes remain essential components of effective management.[9] It is also important to emphasize the beneficial effects of GLP-1 analogues on a range of other health conditions, including reduced risk of developing type 2 diabetes and decreased cardiovascular risk.[9] [10] The most common adverse effects associated with this therapy include nausea, vomiting, and diarrhea. [9] Given the requirement for long-term administration, these adverse events may negatively affect patients’ quality of life. Due to the complexity of the mechanisms regulating energy balance and the emergence of compensatory pathways, the authors suggest that multi-target approaches (therapeutic combinations) and novel molecular targets may yield greater clinical benefits than monotherapy [11]

Orlistat

Another pharmacotherapeutic option for obesity is the use of orlistat. This drug acts by inhibiting the secretion of gastric and pancreatic lipases into the gastrointestinal lumen, thereby reducing the absorption of dietary fats. [12]Studies have demonstrated that treatment with orlistat results in an approximate 5% reduction in body weight in individuals with obesity over a 52-week period. [13]In addition, orlistat contributes to a modest improvement in lipid profile and a reduction in arterial blood pressure. [12] The primary adverse effects of this therapy include diarrhea and impaired absorption of fat-soluble vitamins, which may lead to their deficiency. [12] Pharmacotherapy offers an effective adjunct to lifestyle changes, particularly for patients who do not achieve sufficient weight loss with behavioral interventions alone.

Bariatric Surgery

Bariatric surgery is considered the most effective long-term treatment for obesity.[14] The two most commonly performed procedures are sleeve gastrectomy and Roux-en-Y gastric bypass.[15] Patients typically qualify for bariatric surgery if they meet one of the following criteria:[14] BMI ≥35 kg/m² with obesity-related comorbidities (e.g., type 2 diabetes, hypertension, polycystic ovary syndrome, coronary artery disease, hyperlipidemia, heart failure, obstructive sleep apnea)**,** BMI ≥40 kg/m²

Sleeve Gastrectomy

This procedure involves removal of the gastric fundus and greater curvature, significantly reducing stomach volume and caloric intake. Early complications include staple-line leakage and bleeding. Long-term complications notably include gastroesophageal reflux disease (GERD), which significantly increases the risk of Barrett's esophagus.[14]

Roux-en-Y Gastric Bypass

The surgery creates a small gastric pouch that is anastomosed to the jejunum, while the remaining stomach and duodenum form a biliopancreatic limb that reenters the alimentary tract distally. This method is especially beneficial for patients with type 2 diabetes due to enhanced GLP-1 secretion and improved insulin release.[14]

Intragastric balloon

Moreover, bariatric procedures can also be performed endoscopically, which offers new opportunities in the treatment of obesity and is associated with a lower perioperative risk compared with conventional surgical approaches. [16] An example of such a procedure is the placement of an intragastric balloon. Its presence in the stomach contributes to earlier satiety, leading to reduced food intake and potentially influencing neuroendocrine signaling within the gastrointestinal tract. Studies have demonstrated an average weight loss of 10.5–13.7 kg after a 3-month treatment period and 12–26.3 kg after 6 months of therapy with an intragastric balloon. [16] [17], [18] The main complications associated with this intervention include pain, peptic ulcer disease, gastroesophageal reflux, and balloon migration.[16]

Bariatric surgery results in substantial and sustained weight loss, with studies demonstrating loss of 45.9–80.9% of excess body weight over 10–25 years. Meta-analyses indicate a 49.2% reduction in long-term mortality compared with non operated patients. Perioperative mortality is low (0.04%), with an overall complication rate of 1.5–4.8%.[14][15] Common postoperative deficiencies include micronutrient deficits (iron, magnesium, selenium, zinc, vitamins A, D, E, C, B1, B3, B6, B9, and B12). Patients also face a higher risk of Barrett's esophagus, warranting endoscopic surveillance every 2–3 years.[14]

Fecal Microbiota Transplantation (FMT)

The gut microbiota plays a crucial role in human physiology. Advances in sequencing technologies have revealed associations between dysbiosis and obesity through mechanisms such as inflammation-induced insulin resistance, altered peptide hormone secretion, impaired satiety, and increased caloric intake.[19] FMT has shown high efficacy in treating recurrent *Clostridioides difficile* infection and is now being explored as a therapy for metabolic diseases.[19] Studies suggest improvements in glucose metabolism, insulin resistance, blood pressure, lipid profile, inflammatory markers, and modest reductions in body weight and BMI.[20] The most common adverse effect is abdominal pain. Further research is required to standardize protocols and evaluate long-term outcomes.[20] However, it represents an alternative for patients struggling with obesity who do not wish to undergo surgical procedures.

Deep Brain Stimulation (DBS) traditionally used to treat neurological disorders and anorexia nervosa, is being investigated as a potential therapy for obesity. Electrodes are implanted in the lateral hypothalamus or nucleus accumbens. Preliminary findings show a mean BMI reduction of approximately 4% over 17 months. [21]Although promising, DBS remains experimental and requires extensive research to assess efficacy, safety, and long-term effects.[21]

Conclusions

Obesity poses an increasingly significant challenge in modern medicine. Its multifactorial pathogenesis has facilitated the development of numerous therapeutic approaches essential for preventing serious comorbidities and reducing mortality. This review presents the primary treatment strategies: lifestyle modification, pharmacotherapy, bariatric surgery, and emerging experimental methods such as fecal microbiota transplantation and deep brain stimulation. Each approach has distinct advantages and limitations, but current evidence positions bariatric surgery as the most effective intervention, offering the greatest sustained weight reduction with low complication and mortality rates. Lifestyle modification remains an indispensable component of all treatment pathways; however, when used in isolation, it frequently results in weight regain. Comprehensive management combining lifestyle changes with appropriate adjunctive therapies provides the best chance of durable weight loss, improved metabolic parameters, and enhanced quality of life.

Discussion

Obesity is a multifactorial condition that requires a comprehensive therapeutic strategy. While lifestyle modification remains the cornerstone of treatment, our review confirms it is often insufficient as a standalone therapy, typically yielding only a modest 5–10% weight loss due to physiological counter-regulatory mechanisms and metabolic "set points." Pharmacological interventions have advanced significantly. GLP-1 receptor agonists (e.g., semaglutide, tirzepatide) demonstrate superior efficacy (approximately 20% weight loss) compared to older agents like orlistat (~5%) and offer additional cardiovascular benefits. However, their long-term utility is limited by gastrointestinal adverse effects and the risk of weight regain upon discontinuation. Current evidence identifies bariatric surgery as the most effective long-term intervention, achieving 45.9–80.9% excess weight loss and significantly reducing mortality. Despite these superior outcomes, surgical risks—including nutritional deficiencies and potential complications like Barrett's esophagus—require careful patient selection and lifelong monitoring. Experimental modalities, such as Fecal Microbiota Transplantation and Deep Brain Stimulation, show promise for metabolic regulation but lack standardized protocols. Ultimately, the most durable clinical outcomes are achieved not by a single method, but through an integrated approach combining permanent behavioral changes with appropriate pharmacological or surgical adjuncts.

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Receiving funding – not applicable

All authors have read and agreed with the published version of the manuscript.

Funding Statement: The article did not receive any funding.

Conflict of Interest Statement: Authors declare no conflicts of interest.

REFERENCES

1. Safaei, M., Sundararajan, E. A., Driss, M., Boulila, W., & Shapi'i, A. (2021). A systematic literature review on obesity: Understanding the causes & consequences of obesity and reviewing various machine learning approaches used to predict obesity. *Computers in Biology and Medicine, 136*, Article 104754. https://doi.org/10.1016/j.compbiomed.2021.104754
2. Caballero, B. (2019). Humans against obesity: Who will win? *Advances in Nutrition, 10*(Suppl. 1), S4–S9. https://doi.org/10.1093/advances/nmy055
3. Gallo, G., Desideri, G., & Savoia, C. (2024). Update on obesity and cardiovascular risk: From pathophysiology to clinical management. *Nutrients, 16*(16), Article 2781. https://doi.org/10.3390/nu16162781
4. Hachuła, M., Kosowski, M., Zielańska, K., Basiak, M., & Okopień, B. (2023). The impact of various methods of obesity treatment on the quality of life and mental health—A narrative review. *International Journal of Environmental Research and Public Health, 20*(3), Article 2122. https://doi.org/10.3390/ijerph20032122
5. Dhuli, K., et al. (2022). Physical activity for health. *Journal of Preventive Medicine and Hygiene, 63*(2 Suppl. 3), E150–E159. https://doi.org/10.15167/2421-4248/jpmh2022.63.2s3.2756
6. Sannidhi, D., et al. (2025). Lifestyle medicine for obesity in the era of highly effective anti-obesity treatment. *Nutrients, 17*(14), Article 2382. https://doi.org/10.3390/nu17142382
7. Hope, D. C. D., Vincent, M. L., & Tan, T. M. M. (2021). Striking the balance: GLP-1/glucagon co-agonism as a treatment strategy for obesity. *Frontiers in Endocrinology, 12*, Article 735019. https://doi.org/10.3389/fendo.2021.735019
8. Tirandi, A., Montecucco, F., Carbone, F., & Liberale, L. (2024). Role of glucagon-like peptide-1 receptor agonists in the treatment of obesity, cardiovascular disease, and cerebrovascular disease. *Polish Archives of Internal Medicine, 134*(2). https://doi.org/10.20452/pamw.16658
9. Pedersen, S. D., Manjoo, P., Dash, S., Jain, A., Pearce, N., & Poddar, M. (2025). Pharmacotherapy for obesity management in adults: 2025 clinical practice guideline update. *CMAJ, 197*(27), E797–E809. https://doi.org/10.1503/cmaj.250502
10. Vilsbøll, T., Christensen, M., Junker, A. E., Knop, F. K., & Gluud, L. L. (2012). Effects of glucagon-like peptide-1 receptor agonists on weight loss: Systematic review and meta-analyses of randomised controlled trials. *BMJ, 344*, Article d7771. https://doi.org/10.1136/bmj.d7771
11. Narayanaswami, V., & Dwoskin, L. P. (2017). Obesity: Current and potential pharmacotherapeutics and targets. *Pharmacology & Therapeutics, 170*, 116–147. https://doi.org/10.1016/j.pharmthera.2016.10.015
12. Heck, A. M., Yanovski, J. A., & Calis, K. A. (2000). Orlistat, a new lipase inhibitor for the management of obesity. *Pharmacotherapy, 20*(3), 270–279. https://doi.org/10.1592/phco.20.4.270.34882
13. Khera, R., et al. (2016). Association of pharmacological treatments for obesity with weight loss and adverse events: A systematic review and meta-analysis. *JAMA, 315*(22), 2424–2434. https://doi.org/10.1001/jama.2016.7602
14. Shilton, H. (2025). Bariatric surgery. *Australian Journal of General Practice, 54*(4), 202–206. https://doi.org/10.31128/ajgp-10-24-7432
15. Han, Y., Jia, Y., Wang, H., Cao, L., & Zhao, Y. (2020). Comparative analysis of weight loss and resolution of comorbidities between laparoscopic sleeve gastrectomy and Roux-en-Y gastric bypass: A systematic review and meta-analysis based on 18 studies. *International Journal of Surgery, 76*, 101–110. https://doi.org/10.1016/j.ijsu.2020.02.035
16. Kim, S. H., Chun, H. J., Choi, H. S., Kim, E. S., Keum, B., & Jeen, Y. T. (2016). Current status of intragastric balloon for obesity treatment. *World Journal of Gastroenterology, 22*(24), 5495–5504. https://doi.org/10.3748/wjg.v22.i24.5495
17. De Castro, M. L., et al. (2010). Efficacy, safety, and tolerance of two types of intragastric balloons placed in obese subjects: A double-blind comparative study. *Obesity Surgery, 20*(12), 1642–1646. https://doi.org/10.1007/s11695-010-0128-9
18. Giardiello, C., Borrelli, A., Silvestri, E., Antognozzi, V., Iodice, G., & Lorenzo, M. (2012). Air-filled vs water-filled intragastric balloon: A prospective randomized study. *Obesity Surgery, 22*(12), 1916–1919. https://doi.org/10.1007/s11695-012-0786-x
19. Porcari, S., et al. (2023). Key determinants of success in fecal microbiota transplantation: From microbiome to clinic. *Cell Host & Microbe, 31*(5), 712–733. https://doi.org/10.1016/j.chom.2023.03.020
20. Hu, D., Zhao, J., Zhang, H., Wang, G., & Gu, Z. (2023). Fecal microbiota transplantation for weight and glycemic control of obesity as well as the associated metabolic diseases: Meta-analysis and comprehensive assessment. *Life, 13*(7), Article 1488. https://doi.org/10.3390/life13071488
21. Franco, R., et al. (2016). DBS for obesity. *Brain Sciences, 6*(3), Article 21. https://doi.org/10.3390/brainsci6030021