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CONTEMPORARY MANAGEMENT OF PEDIATRIC OBESITY: A NARRATIVE REVIEW

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ABSTRACT

Background: Pediatric obesity is widely regarded as a heterogeneous, chronic disease associated with metabolic, cardiovascular, and psychosocial consequences. Its increasing prevalence highlights the need for comprehensive, evidence-based management strategies.
Aims: This narrative review aims to synthesize current evidence on therapeutic approaches for pediatric obesity, including behavioral management, pharmacologic and surgical treatment, and to highlight emerging treatment directions.
Methods: A narrative review was based on a PubMed search, covering studies published through February 2026. Search terms included keywords related to pediatric obesity and related management strategies. Eligible studies included clinical trials, observational studies, systematic reviews, meta-analyses, and clinical guidelines evaluating treatment outcomes in patients aged under 18 years. Evidence was synthesized according to SANRA guidelines.
Results: Lifestyle and behavioral interventions persist as the foundation of pediatric obesity management. However, their long-term effectiveness is often suboptimal. Glucagon-like-peptide-1 receptor agonists demonstrate meaningful reductions in BMI along with improvement of obesity-related comorbidities, representing a substantial advancement in pharmacologic therapy. In cases of children with severe obesity not responding to conservative and medical treatment, the most significant weight reduction is provided by metabolic and bariatric surgery. Emerging therapies that target metabolic pathways and the gut microbiome appear promising, yet require additional validation.
Conclusions: The treatment and management of pediatric obesity is shifting toward a tailored approach integrating behavioral, pharmacologic, and surgical strategies. Novel pharmacotherapies have significantly expanded treatment options, but long-term safety data and comparative studies remain limited. Multidisciplinary, individualized care is crucial to optimize outcomes in this complex disease.

KEYWORDS

Pediatric Obesity; Childhood Obesity; Adolescent Obesity; Obesity Managements; GLP-1 Agonists; Surgery, Bariatric; Surgery, Metabolic

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1. Introduction

The prevalence of obesity in children and adolescents has risen markedly over recent decades, establishing it as a significant global public health concern [1]. Pediatric obesity is now recognized clinically as a multifactorial, chronic condition. Contributing factors include genetic predisposition, environmental influences, lifestyle behaviors, and individual metabolic processes, necessitating a comprehensive and multifaceted approach to management [1]. According to the American Academy of Pediatrics, overweight status is defined by a Body Mass Index (BMI) between the 85th and 95th percentiles for age and sex, while obesity is classified as a BMI at or above the 95th percentile [1]. Presently, more than 14.4 million U.S. children and adolescents meet these criteria [1].

The ramifications of pediatric obesity extend beyond excess adiposity, with early manifestations of metabolic syndrome, including dyslipidemia, hypertension, and insulin resistance - these metabolic disturbances frequently persist into adulthood, elevating long-term risks for cardiovascular and endocrine disorders through disruptions in adipose tissue biology, inflammatory pathways, and hormonal regulations [2].

Moreover, the psychosocial impact of obesity in children is substantial. Affected individuals often experience diminished quality of life, with increased incidence of depressive symptoms and disordered eating behaviors. Importantly, the relationship between obesity and mental health is bidirectional, further complicating management [3].

Given the complex interplay of contributing factors and the broad spectrum of health consequences, effective obesity treatment requires a comprehensive, family-centered, multidisciplinary approach [3-5]. International guidelines emphasize the importance of engaging families in interventions that encompass dietary modification, physical activity, and behavioral change strategies [1,6]. Family involvement has been consistently associated with improved adherence to healthy behaviors and more favorable outcomes [7]. Regular structured physical activity and evidence-based behavioral interventions are critical components that support both physical and psychological well-being [8].

However, lifestyle modification alone is frequently insufficient, particularly in cases of moderate to severe obesity [6]. In such instances, adjunctive therapies are warranted [6].

Advances in the understanding of appetite regulation and energy homeostasis have led to the development and increasing utilization of pharmacologic agents. [1,4,9]. Weight management medications, including glucagon-like-peptide-1 (GLP-1) receptor agonists such as liraglutide and semaglutide, are now considered for pediatric patients with significant obesity, especially those with comorbidities or inadequate response to lifestyle interventions [10-13]. These agents act on physiological pathways to promote weight reduction and have demonstrated efficacy in pediatric populations [10-13]. Consequently, there is a trend toward earlier integration of pharmacotherapy in treatment algorithms, reflecting its potential to produce clinically meaningful weight loss and health improvements [4,14].

For severely obese adolescents without sufficient improvement from behavioral and pharmacologic interventions, metabolic or bariatric surgery remains a well-validated therapeutic option [15,16]. Surgical interventions can yield durable weight loss and metabolic improvements, though careful patient selection and long-term multidisciplinary follow-up are essential to optimize safety and efficacy [1,5]. Clinical guidelines underscore the necessity of ongoing comprehensive care by specialized teams throughout the perioperative and postoperative periods [15,16].

In summary, the management of pediatric obesity requires a tailored approach that integrates lifestyle, behavioral, pharmacological, and surgical modalities as appropriate to each patient's needs and context [6,14,17]. Continuous refinement of treatment strategies is essential - this review aims to synthesize current knowledge on pediatric obesity management and highlight key directions for future research and clinical practice.

2. Methods

This narrative review was designed as a structured narrative review with transparent search and selection procedures. A comprehensive search was performed in PubMed from database inception up to February 2026, using pediatric obesity–related terms such as "pediatric obesity", "childhood obesity", "adolescent obesity", "obesity treatment", "obesity management", "GLP-1 receptor agonist", "liraglutide", "semaglutide", "bariatric surgery", "metabolic surgery" combined with outcome-related terms including "body mass index", "weight reduction", "cardiometabolic risk", "quality of life", and "treatment outcomes". Only full-text articles published in English were considered eligible.

2.1. Inclusion Criteria

Eligible studies included original clinical, epidemiological, or interventional research examining therapeutic strategies for pediatric obesity, conservative treatment strategies, pharmacological management, and metabolic or bariatric surgery. Inclusion required that studies report outcomes related to weight change, body mass index (BMI), cardiometabolic health parameters, and treatment safety. Systematic reviews, meta-analyses, and clinical guidelines were also included if they provided extractable data relevant to the review objectives.

2.2. Exclusion Criteria

Exclusion criteria included opinion articles, narrative reviews without original data, conference abstracts without accessible full text, studies focused solely on adult populations, animal or in vitro experiments, and any publication lacking accessible full-text English versions.

This review was conducted in accordance with the SANRA (Scale for the Assessment of Narrative Review Articles) guidelines to ensure methodological transparency, critical appraisal of evidence, and structured synthesis.This review followed a structured narrative approach and did not aim to perform a formal systematic review or quantitative synthesis.

3. Results

3.1. Lifestyle and Behavioral Interventions

Modifying daily behaviors remains the primary strategy for managing pediatric obesity, as consistently supported by numerous studies [5,6,8]. Evidence indicates that active family involvement, particularly when parents participate directly, not only enhances weight loss outcomes for children but also improves adherence to intervention programs [5,7]. This is substantiated by a randomized clinical trial, conducted by Epstein et al., that demonstrated that structured, family-based therapy led by trained pediatric clinicians yields superior results compared to standard care [7].

The integration of digital health interventions is also gaining prominence - a study by Heerman et al. has shown that children at risk for obesity who engage with mobile and remote support programs experience improvements in dietary habits, physical activity levels, and weight status [18]. Systematic evidence affirms that a comprehensive approach, incorporating dietary modifications, increased physical activity, and behavioral interventions, produces measurable, albeit modest, reductions in BMI among pediatric and adolescent populations [5,6].

Physical activity alone is also associated with significant benefits. In addition to facilitating weight reduction, regular exercise contributes to enhanced quality of life, greater endurance, and improved metabolic health, making it an essential component of effective obesity treatment protocols [8].

Furthermore, the psychological dimension of obesity requires careful consideration [3,5,6]. A narrative overview documented a bidirectional relationship between obesity and eating disorders, which complicates treatment adherence among affected youth and necessitates an integration of mental health support into obesity interventions for optimizing treatment outcomes [3].

All studies discussed in this section, along with supplementary information, are presented in Table 1.

Table 1. Summary of Lifestyle and Behavioral Interventions for Pediatric Obesity

Ref.	Intervention Type	Description	Typical Effects on BMI and Related Outcomes	Strengths	Limitations
[5], [7]	Family-based behavioral therapy	Parent-focused strategies reinforcing healthy behaviors, structure routines and support adherence	Significant BMI reduction when parents actively engaged, improved adherence and maintenance of behavior change	Strongest evidence base among lifestyle interventions, effective when integrated into primary care	Requires sustained family involvement, outcomes may vary with home environment
[5], [6]	Multicomponent lifestyle programs	Combined dietary counseling, physical activity, behavioral modification	Modest but clinically meaningful reductions in BMI across childhood and adolescence	Comprehensive and aligned with guideline recommendations, adaptable across settings	Resource-intensive, weight regain common without ongoing support
[8]	Physical activity interventions	Structured programs focused on aerobic or mixed training	Improvements in fitness, quality of life, metabolic parameters, modest effect on BMI	Enhances cardiometabolic health and well-being, important adjunct to other therapies	Limited impact on BMI without concurrent dietary or behavioral strategies
[18]	Digital and telehealth interventions	Mobile applications, remote coaching and digital self-monitoring tools	Improvements in physical activity, dietary behaviors and weight-related outcomes	High accessibility, low-cost, scalability, supports families with limited in-person access	Long-term effectiveness and engagement remain uncertain
[3], [5], [6]	Psychosocial and psychological support	Counseling to address emotional distress, disordered eating, motivation, adherence	Improves treatment adherence, addresses barriers related to depression, anxiety, emotional eating	Essential for patients with comorbid mental health symptoms, supports sustained behavioral change	Requires trained mental health providers, variable availability

3.2. Pharmacological Interventions

A. GLP-1 Receptor Agonists

Glucagon-like peptide-1 (GLP-1) receptor agonists function by mimicking the effects of endogenous GLP-1, an incretin hormone produced in the gastrointestinal tract that regulates appetite, satiety, and glycemic control. These agents act on central appetite-regulating pathways, leading to reduced hunger and increased satiety [9]. This mechanistic profile underlies the observed efficacy of GLP-1 receptor agonists in promoting weight reduction among pediatric populations. Meta-analytic evidence by Ryan et al. supports these findings, demonstrating significant reductions in BMI and improvements in metabolic parameters in children and adolescents with obesity who are treated with GLP-1 receptor agonists [13].

Semaglutide

Semaglutide has rapidly emerged as a prominent pharmacological intervention for adolescent obesity [10,19,20]. A large randomized clinical trial by Weghuber et al. demonstrated that weekly administration of semaglutide resulted in significantly greater weight reduction among adolescents compared to placebo, accompanied by improvements in both cardiovascular and metabolic parameters [10]. Van Boxel et al. further supported these findings with real-world evidence from clinical practice, where adolescents treated with semaglutide have experienced substantial decreases in BMI and enhancements in metabolic profiles [19]. A recent systematic review by Bensignor et al. concluded that semaglutide is effective for the majority of adolescents and is generally well-tolerated, although they are not free from adverse effects, with gastrointestinal events, like nausea and vomiting, being the most frequently reported ones [20]. Other potential risks, including cholelithiasis, pancreatitis, altered eating behaviors, and mental health concerns have been reported primarily in adult populations or as isolated case reports, and comprehensive long-term safety data in the pediatric population are lacking [20].

Nonetheless, the utilization of GLP-1 receptor agonists like semaglutide among adolescents and young adults has risen rapidly - prescription rates for these agents increased substantially between 2020 and 2023, reflecting the swift integration of these medications into clinical practice for youth with obesity [21].

Liraglutide

Liraglutide has demonstrated robust evidence supporting its efficacy in pediatric obesity management [11,17,22]. In a large-scale randomized controlled trial by Kelly et al. involving adolescents aged 12 to 17 years, daily administration of liraglutide resulted in significantly greater reductions in BMI compared to placebo over a 56-week period [11]. More recently, a study by Fox et al. extended these findings to a younger cohort, ages 6 to under 12 years, also observing clinically meaningful decreases in BMI [17].

Analysis of data from the SCALE Teens trial, conducted by Bensignor et al., identified preliminary predictors of therapeutic response, such as baseline BMI, appetite measures, and specific metabolic parameters, suggesting the potential for developing more individualized strategies in the future [22].

Regarding safety, meta-analytic evidence indicated that both liraglutide and semaglutide are effective and generally well tolerated in pediatric populations, although gastrointestinal adverse events and treatment discontinuation remain notable concerns [13].

Additionally, a systematic review by Chadda et al. reported consistent reductions in BMI across studies, while emphasizing the importance of ongoing evaluation of long-term safety outcomes [12].

B. Broader Pharmacotherapy

While GLP-1 receptor agonists have garnered significant attention for their role in treating pediatric obesity, other pharmacotherapies, including orlistat, metformin, and topiramate, have also been evaluated and present more modest effects [4,23,24]. A comprehensive review by Fox et al. showed more modest efficacy of these agents, but they may offer therapeutic benefit, particularly for children with comorbid conditions [4].

Evidence from a network meta-analysis by Yang et al. indicates that semaglutide is associated with the greatest reduction in BMI among available pharmacologic interventions, while older agents exhibited small to moderate efficacy, except for the combination of phentermine and topiramate (PHEN/TPM), which demonstrated comparable results to GLP-1 receptor agonists [23]. These findings are corroborated by a recent Cochrane review by Torbahn et al., which consistently reported superior outcomes with newer anti-obesity medications relative to older treatments, however the long-term safety and efficacy of these medications in pediatric populations remain uncertain [24].

A recent review by Armstrong et al.has highlighted several important gaps in the current evidence base, including a paucity of long-term safety data, limited accessibility of these medications for children and adolescents, and a lack of robust head-to-head clinical trials in younger cohorts [14].

All studies discussed in this section, along with supplementary information, are presented in Table 2.

Table 2. Summary of Pharmacologic Treatments for Pediatric Obesity

Ref.	Drugs/Class	Mechanism of Action	Effectiveness	Safety Consideration	Notes
[10], [12], [13], [19], [20], [21]	Semaglutide (GLP-1 receptor agonist)	Enhances satiety, decreases appetite, delays gastric emptying	Produces the largest BMI reductions among available agents, strong effects in clinical trials and real-world studies	GI symptoms (nausea, vomiting), need for adherence to weekly injections, unknown long-term pediatric safety	Strongest efficacy profile to date, rapid clinical uptake
[11], [12], [17], [22]	Liraglutide (GLP-1 receptor agonist)	Same as semaglutide	Significant BMI reduction vs placebo, effective across adolescent and younger pediatric cohorts, predictors of response identifies	GI side effects, potential treatment discontinuation, long-term safety data limited	Daily subcutaneous injection, established pediatric evidence
[4], [23], [24]	Orlistat	Inhibits intestinal lipase, reducing fat absorption	Modest BMI reductions, limited metabolic improvement	Frequent GI side effects – steatorrhea, fecal urgency, adherence challenges	Rarely used due to tolerability
[4], [23], [24]	Metformin	Improves insulin sensitivity, reduces hepatic glucose production	Small reductions in BMI, beneficial for insulin resistance	GI discomfort, rare lactic acidosis	Common adjunct in youth with prediabetes or PCOS, off-label for obesity
[4], [23]	Topiramate	Appetite suppression via GABA modulation	Modest BMI reductions, variable pediatric evidence	Cognitive slowing, paresthesia, mood changes	Off-label, requires careful monitoring
[23]	Phentermine-Topiramate	Appetite suppression via adrenergic effects + topiramate mechanism	Strong BMI reductions comparable to semaglutide in network meta-analysis	Teratogenicity, insomnia, tachycardia	Not approved for pediatric use
[12], [13], [14]	Other agents in development	Dual agonists, combination therapies, metabolic modulators	Early data suggest potential future roles	Safety profiles not yet established	Represents key research direction

3.3. Bariatric and Metabolic Surgery

Bariatric surgery is increasingly recognized as a viable intervention for adolescents with severe obesity, particularly in cases where lifestyle modifications and pharmacotherapy have proven insufficient [5]. Current clinical guidelines for pediatric obesity recommend considering surgical options for youth with markedly elevated BMI, typically defined as at least 120% of the 95th percentile or a BMI of 35 kg/m2, accompanied by significant comorbidities, following the failure of conservative management [5]. In addition to meeting specific BMI thresholds, current expert consensus emphasizes that candidates for adolescent bariatric surgery must demonstrate both physical and emotional maturity, have obesity-related comorbidities that are expected to improve postoperatively, as well as demonstrate the ability to adhere to recommended long-term follow-up care [15,16]. Bariatric surgery is contraindicated in cases where weight gain is attributable to treatable medical conditions, in the presence of untreated or unstable psychiatric disorders, ongoing substance abuse, or insufficient family or social support necessary for sustained postoperative management [15,16].

A comprehensive review conducted by Fox et al. indicated that bariatric procedures such as sleeve gastrectomy and Roux-en-Y gastric bypass are associated with substantial and sustained weight loss in adolescent patients, contributing to notable improvements in obesity-related comorbidities, including hypertension, dyslipidemia, and type 2 diabetes [17].

However, according to guidelines, such surgeries must be conducted exclusively within specialized centers equipped to deliver comprehensive multidisciplinary care, providing integrated support encompassing nutritional guidance, mental health services, and ongoing longitudinal follow-up, as long-term management is critical to optimizing patient outcomes [5].

All studies discussed in this section, along with supplementary information, are presented in Table 3.

Table 3. Bariatric Surgery Outcomes in Adolescents with Severe Obesity

Ref.	Procedure	Typical BMI Reduction	Metabolic and Comorbidity Outcomes	Safety Consideration	Advantages
[5], [15], [16], [17]	Sleeve gastrectomy (SG)	Approximately 25-30% BMI reduction within 1-3 years	High rates of improvement of remission in type 2 diabetes, hypertension, dyslipidemia, insulin resistance	Risk of gastroesophageal reflux, micronutrient deficiencies, need for lifelong supplementation and monitoring	Technically simpler procedure, lower malabsorption risk compared to RYGP, widely used in pediatric bariatric centers
[5], [15], [16], [17]	Roux-en-Y gastric bypass (RYGP)	Approximately 30-35% BMI reduction within 1-3 years	Strong improvements in glycemic control, cardiometabolic risk factors, quality of life	Higher risk of internal hernia, dumping syndrome, micronutrient deficiencies, requires strict lifelong follow-up	Long-standing evidence base, robust metabolic benefits
No longer in guidelines	Adjustable gastric banding	Modest BMI reduction (~10-15%)	Limited impact on metabolic outcomes	High rates of reoperation, band complications, insufficient long-term weight loss	Reversible, low initial surgical risk
[5], [15], [16],	Overall outcomes across procedures	Substantial improvements in weight, cardiometabolic health, physical functioning and quality of life	Enhanced self-esteem and psychosocial well-being reported in many cohorts	Lifelong nutritional monitoring is essential, requires multidisciplinary care	Most effective treatment for severe pediatric obesity when conservative measures fail

3.4. Emerging and Adjunctive Therapies

Emerging research has explored novel strategies for addressing obesity, with particular emphasis on metabolic pathways and the gut microbiome. Preliminary studies in pediatric populations indicate that supplementation with butyrate may attenuate inflammation and ameliorate metabolic disturbances [25]. These findings suggest that modulation of the gut microbiome could represent a promising element for future obesity management [25].

Advancements in the understanding of obesity pathophysiology continue to emerge. Contemporary investigations have elucidated the complex interplay among metabolic syndrome, insulin resistance, and chronic inflammation, metabolic and microbiome-related approaches [2]. Additionally, research on GLP-1 has clarified the mechanisms by which incretin-based therapies suppress appetite and enhance metabolic function, thereby substantiating their clinical utility in obesity management [9].

4. Discussion

4.1. Reassessing the Role of Lifestyle and Behavioral Therapy

As we showed in the results of this narrative review, the management of pediatric obesity requires a comprehensive, multifaceted approach integrating behavioral modification, pharmacotherapy, and surgical interventions in selected cases [5,17]. While lifestyle and behavioral interventions remain foundational to treatment, their efficacy is often variable and may not yield significant or sustained results across diverse populations [6]. Evidence suggests that family-based interventions, particularly those implemented in primary care settings, enhance outcomes [5,7]. Furthermore, digital health platforms have shown promise in facilitating positive dietary behaviors and increasing physical activity among pediatric populations [18]. Despite these advancements, long-term weight maintenance remains challenging, underscoring the necessity for adjunctive therapies [6].

An important consideration is the psychosocial dimension of pediatric obesity - the bidirectional relationship between obesity and eating disorders can complicate adherence to treatment regimens and exacerbate psychological distress [3]. Consequently, the integration of psychological support is essential within comprehensive care models [3].

4.2. Expanding the Role of Pharmacotherapy

Pharmacological intervention is assuming an increasingly central role in pediatric obesity management, particularly with the advent of novel agents such as GLP-1 receptor agonists. [4,10,12,13]. These agents have demonstrated superior weight reduction compared to lifestyle interventions alone, prompting greater utilization, especially among adolescents with inadequate response to behavioral therapy [4,10,21]. Clinical trials consistently support the efficacy of GLP-1 receptor agonists, however challenges persist regarding long-term safety, accessibility, cost, and adherence [12-14,20]. Medications such as liraglutide and semaglutide now represent important therapeutic options, though variability in individual response and tolerability necessitates personalized treatment strategies [11,22].

Notwithstanding the expanding role of pharmacotherapy, lifestyle modification remains the cornerstone of pediatric obesity management - pharmacological agents are best conceptualized as adjuncts within a comprehensive, guideline-concordant treatment framework [5]. Critical gaps remain in the literature, including optimal treatment duration, the sustainability of pharmacologically induced weight loss, and the effect of combination therapies [14,23,24].

4.3. Limitations of Non-GLP-1 Pharmacologic Options

Alternative pharmacotherapies, including orlistat, metformin, and topiramate, have demonstrated modest efficacy but do not approach the magnitude of weight reduction achieved with GLP-1 receptor agonists [4]. Comparative studies corroborate the superior impact of GLP-1 agents on BMI reduction in pediatric cohorts [23]. Nonetheless, further research is warranted, with calls for direct comparative trials, extended follow-up, and robust evaluation of multimodal treatment regimens [14].

4.4 Indications and Outcomes of Bariatric and Metabolic Surgery

Metabolic and bariatric surgery may be indicated for adolescents with severe obesity refractory to medical and behavioral management [5]. Current clinical guidelines endorse bariatric procedures within specialized centers, where multidisciplinary teams can optimize perioperative care, monitor nutritional status, and provide psychological support, ensuring substantial and durable weight loss and improvements in obesity-related comorbidities [17]. However, appropriate patient selection, long-term follow-up, and the management of procedure-specific risks remain essential to optimizing outcomes in this population [5].

4.5. Strengths, Limitations, and Clinical Implications

This review synthesizes the most recent evidence, including novel clinical trials and updates on pharmacological interventions, to provide a comprehensive overview of current management strategies for pediatric obesity. While narrative reviews do not adhere to stringent systematic methodologies, this approach is advantageous in the context of rapidly evolving data, enabling the integration of emerging findings and prioritizing clinically relevant consideration.

Nonetheless, this review is subject to several limitations. The majority of studies examining pediatric obesity, particularly those evaluating pharmacologic interventions, are of short duration, often involve small or selective pediatric cohorts, and utilize heterogeneous outcome measures, making cross-study comparisons

and assessment of long-term efficacy challenging. There is currently limited robust evidence regarding the long-term safety and sustainability of GLP-1 receptor agonists in children, as well as data on real-world adherence to these therapies. Additionally, there is a paucity of direct comparative studies among different treatment modalities. These limitations may render current recommendations subject to change.

Implications for clinicians and patients include the need for early identification of candidates who may benefit from pharmacotherapy, ensuring timely access to multidisciplinary obesity management programs, and continued surveillance of the long-term safety and efficacy of novel therapeutic agents.

Taken together, the evidence suggests that the management of pediatric obesity is increasingly adopting a personalized, stepwise approach - clinical decision-making is now more closely aligned with the severity of obesity, the presence of comorbidities, and individual patient responses to various interventions [14]. Lifestyle modification, encompassing dietary improvement and increased physical activity, remains the cornerstone of therapy, though it is frequently insufficient as a standalone intervention [6]. GLP-1 receptor agonists have emerged as effective agents for adolescents with moderate to severe obesity, demonstrating meaningful weight reduction [10,11]. In cases of refractory obesity with significant health risk, metabolic surgery remains the standard of care [5]. Ongoing research is expanding the therapeutic landscape, with new modalities targeting metabolic pathways and the gut microbiome [25]. Ultimately, optimal management requires a multidisciplinary, patient-centered approach, recognizing the multifactorial etiology of pediatric obesity, which encompasses biological, psychological, and social determinants of health [3,5,17].

5. Conclusions

In conclusion, pediatric obesity is a multifactorial, chronic disease requiring individualized management strategies. While lifestyle modifications and behavioral interventions remain foundational components of therapy, their long-term efficacy is often limited. Recent advances, such as the introduction of GLP-1 receptor agonists, have significantly expanded therapeutic options, demonstrating efficacy in adolescents for whom traditional interventions have been insufficient. In cases of severe obesity complicated by comorbidities, metabolic and bariatric surgery continues to offer the most substantial and sustained outcomes when other treatments have failed. Emerging research into therapies targeting the microbiome and metabolic pathways holds promise for future intervention modalities. Ultimately, optimal management necessitates a multidisciplinary, patient-centered approach that addresses the unique clinical and psychological needs of each child, recognizing that effective obesity treatment cannot be standardized across all pediatric populations.

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