Review

Key Gaps in the Prevention and Treatment of Obesity in Children and Adolescents: A Critical Appraisal of Clinical Guidelines

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Key Gaps in the Prevention and Treatment of Obesity in Children and Adolescents: A Critical Appraisal of Clinical Guidelines

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Abstract: Background: The worldwide increase in the prevalence of childhood obesity necessitates effective prevention and treatment strategies. Clinical practice guidelines (CPGs) offer guidance, but significant heterogeneity or Lack of practical application exists in their recommendations. The purpose of the present to provide an expert, comprehensive and comparative analysis of gaps in current CPGs for the prevention and treatment of obesity in children and adolescents. Results: A total of 13 CPGs were identified, focusing on childhood obesity prevention (n=10), treatment (n=9), or both (n=6). Prevention CPGs recommend incorporating BMI assessment however, specific frequency of measurement is often lacking. Some offer specific dietary recommendations by age, but graphical tools are absent. Increasing physical activity and minimizing screen time is recommended in most CPGs, but age-specific guidance is lacking. Also, recommendations on mental health or sleep are absent. Treatment CPGs recommend BMI for childhood obesity diagnosis but there are inconsistencies in cut-off points among CPGs. Assessment for comorbidities is generally recommended, but age-specific guidance is lacking. Dietary recommendations are present in most CPGs, but some lack details (number of meals per day, portion size, macronutrient percentages, examples according to age). Most CPGs recommended 60 minutes of physical activity/day and limit screen time to 2 hours/day. Recommendations on sleep are absent. Most CPGs acknowledge parental importance but lack specific guidance for their active involvement in childhood obesity prevention and treatment. Pharmacological treatment options are outdated and surgical treatment is recommended in exceptional cases of severe obesity (BMI ≥ 40 kg/m2 or ≥ 35 kg/m2 with severe comorbid disease). Conclusions: Standardizing BMI cut-off points and defining age groups across CPGs would improve consistency and comparability in the diagnosis, prevention and treatment of childhood obesity. Tailoring recommendations for diet, physical activity, sedentary behavior and sleep to specific age groups would ensure that interventions are developmentally appropriate. A stronger emphasis on early prevention strategies is needed to address the root causes of obesity, while providing clear guidance to parents and families would facilitate their active involvement in both prevention and treatment. Up-to-date information regarding pharmacological and surgical treatments is needed.

Keywords: Obesity; Children; Adolescents; Prevention; Treatment; Clinical guidelines

1. Introduction

The global prevalence of overweight and obesity among children and adolescents has alarmingly increased. According to the World Health Organization (WHO), the prevalence of overweight and obesity among children and adolescents has reached alarming levels, with over 390

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million young people affected in 2022 [1]. This surge in prevalence highlights the urgent need for effective prevention and treatment strategies to mitigate the risk of developing associated complications and comorbidities, as well as managing existing conditions. The etiology of childhood obesity is complex and multifactorial, encompassing a range of factors including genetic predisposition, nutritional habits, physical activity levels, comorbidities, sleep patterns, and familial and community environments [2]. This intricate interplay of factors necessitates a comprehensive understanding by healthcare professionals, families, and patients alike. To navigate this complexity, clinical practice guidelines (CPGs) are sought after to inform both preventative strategies and treatment modalities. However, despite the availability of CPGs, considerable heterogeneity exists in their recommendations, raising concerns about their practicality and implementation across diverse healthcare systems, primary and specialized care settings, and within the family dynamic. This narrative review aims to provide an expert, comprehensive and comparative analysis of gaps in current CPGs for the prevention and treatment of obesity in children and adolescents.

2. Materials and Methods

A comprehensive search was conducted in PubMed, Scopus, and Google Scholar databases to identify CPGs for the prevention and/or treatment of obesity in children and adolescents aged 2 to 19 years. The literature search encompassed all publications up to January 2025, with no restrictions on the publication date of previous studies. The search terms included "clinical guideline", "society", "obesity", "overweight", "children" and "adolescents". To be included in this review, CPGs had to meet specific criteria: publication in English, origin from Western regions (Europe, the United States of America (USA), Canada, or Oceania), and development or publication by a national or international scientific society or organization. This geographic focus allows for a comparative analysis of guidelines within regions sharing similar socioeconomic development, cultural heritage rooted in European traditions, and a prevalent "obesogenic" environment. The CPGs not meeting these criteria, including materials lacking clinical recommendations and documents available only in languages other than English, were excluded. Two researchers (F-FA and AC) worked on the selection of the articles and files following the inclusion/exclusion criteria. The documents were classified into clinical guidelines for prevention of obesity in children and adolescents, treatment of obesity in children and adolescents or both. If there were doubts regarding the inclusion of a publication, the content was reviewed in depth to verify that it included the desired information. Subsequently, inclusion or exclusion was decided by consensus of both researchers. No authors or organizations were contacted. Two researchers (F-FA and AC) worked in the data extraction and synthesis of the information. There were 13 different CPGs selected and included. The content of the available CPGs was analyzed separately for the prevention and the treatment recommendations of childhood obesity. CPGs were classified as focusing on prevention, treatment, or both aspects **(Table 1).** The information extracted included the assessment of obesity (weight status, health status), lifestyle recommendations (diet, physical activity, sedentary behavior, and sleep), treatment (drugs, surgery) and the role of parents/guardians in the prevention/treatment of childhood obesity (**Appendix 1).**

3. Results

A total of 13 CPGs were included in the present narrative review (**Table 1**). They demonstrated substantial heterogeneity in their recommendations, with some focusing on prevention (n=10) [3–12], others on treatment (n=9) [2–5,8,10,12–14], and most addressing both aspects (n=6) [3,4,8,10,12,13].

3.1. Clinical Guidelines for the Prevention of Obesity in Children and Adolescents

Regarding weight status assessment, most of the CPGs for the prevention of childhood obesity recommended the measurement of the body mass index (BMI), however, most did not include recommendations for the periodicity of this assessment [3,4,6,9,12]. Regarding health status, most CPGs for prevention did not include the assessment or screening of organic pathologies (genetic disorders, endocrine disorders) that could lead to the development of obesity [3,6–8,11]. Also, obesity in children and adolescents is associated with co-morbidities such as mental health disorders, however not specific recommendations for their evaluation are included in the guidelines targeting

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prevention [3–12]. Within lifestyle changes, several CPGs recommend exclusive breastfeeding for at least the first 6 months of an infant's life to help prevent obesity later in life [3,4,6]. Also, all CPGs include general aspects about a varied and healthy diet and most of them mention the importance of schools for the promotion and adoption of a healthy diet. However, some CPGs are more detailed regarding optimal dietary intake by providing specific portion recommendations tailored to different age groups [6,11,12]. Furthermore, some emphasize the importance of high-fiber foods, including fruits, vegetables, and whole grains [6,9,11]. For example, the Registered Nurses Association of Ontario (RNAO) guidelines present a table detailing that children aged 4-8 should have 5 servings of vegetables and fruit, 4 servings of grain products, and 3 servings of milk and alternatives daily. In contrast, children aged 9-13 should have 6 servings of vegetables and fruit, 6 servings of grain products, and 3 servings of milk and alternatives. This detailed breakdown ensures that dietary recommendations are adjusted to the varying nutritional needs of children as they grow and develop [6]. Regarding graphical tools, most CPGs fail to include diagrams or tables that could exemplify appropriate servings of different food groups and translate dietary recommendations to meaningful counselling guidance [8,10–13]. Physical activity plays an important role in children's cardiovascular, musculoskeletal, mental and behavioral health, as well as their physical, social, and cognitive development [15]. Most CPGs for the prevention of childhood obesity agree in recommending at least 60 minutes of structured physical activity daily [6,8,10–12]. Also, most of the CPGs highlight the importance of schools to promote physical education and sporting activities [3,4,7]. However, most of the CPGs lack clear recommendations regarding age-specific exercise duration and intensity. Additionally, they fail to provide examples of developmentally appropriate activities and sports for different age groups [3,4,7,9]. Reducing sedentary time is a crucial strategy for preventing obesity and a recreational screen media reduction interventions may result in a substantial increase in children's engagement in physical activity [16]. Most of the reviewed CPGs agree that screen time (such as watching TV or playing video games) should be limited to a maximum of 2 hours per day for children over 2 years old, with no screen time recommended for younger children [3,6,10,11]. However, some prevention CPGs recommendations lack sufficient information on screen use and recommended time limits [7–9]. Furthermore, it is unclear whether these recommendations should be universal or adjusted to specific age groups. Multiple cross-sectional investigations have established a correlation between reduced sleep duration and disrupted sleep cycles with the development of obesity in children [17–20]. Interestingly, there is lack of recommendations on sleep habits since this aspect has not been included in most of the prevention CPGs [2–4,6–9,11–14].

3.2. Clinical Guidelines for the Treatment of Obesity in Children and Adolescents

Nine of the guidelines identified focused on obesity treatment [2–5,8,10,12–14]. All CPGs recommend assessing weight status with the use of percentiles according to BMI for overweight/obesity diagnosis. For children ≥2 years of age, most CPGs agree on the diagnosis of overweight if the BMI is ≥85th percentile and <95th percentile for age and sex, and for the diagnosis of obesity if BMI is ≥95th percentile for age and sex [3,5,10]. However, there are some CPGs according to which the clinical diagnosis can be based on different percentiles for age and sex [4,10,13]. For example, the Spanish Clinical Practice Guideline for the Prevention and Treatment of Childhood and Juvenile Obesity recommends that diagnosis of obesity should be set when BMI is ≥97th percentile for age and sex [4]. Similarly, the Scottish Intercollegiate Guidelines Network recommend that for clinical use, obese children are those with a BMI ≥98th percentile of the United Kingdom (UK) 1990 reference chart for age and sex [13]. Most of the treatment CPGs recommend a detailed medical history and a thorough physical examination to exclude secondary causes of obesity in children and adolescents [3,4,13,14]. For the assessment of health status, most CPGs agree that children with obesity should be also evaluated for comorbidities [5,10,12–14]. Measurements of blood pressure, blood glucose and lipids are recommended [5,10,12,14]. Regarding the evaluation of comorbidities, a practical approach would be to have the specific indications and the studies to be carried out according to the age groups [8,10,14]. A specific example of tailoring recommendations for the evaluation of comorbidities to different age groups is what the Italian guideline for Diagnosis, treatment and prevention of pediatric obesity suggests [10]. This CPG include the following recommendations: measuring cholesterol,

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High-density lipoprotein cholesterol (HDL), and triglycerides in all children and adolescents with obesity starting at the age of 6; measuring blood pressure in all children with overweight or obesity starting at the age of 3; measuring fasting blood glucose in all children and adolescents with overweight or obesity starting at the age of 6, as the first step for screening prediabetes and type 2 diabetes; and assessing transaminases and liver ultrasound in all children and adolescents with obesity starting at the age of 6, among others [10]. When addressing mental health, CPGs agree that psychological support is recommended for the treatment of overweight and obesity in children and adolescents and a referral for specialist consult is needed in the suspicious of depressive and/or anxious symptoms, dysmorphophobia traits, suicidal risk, and eating disorders [3,8,10,13]. However, they do not recommend specifically that psychological traits should be evaluated as part of the routine clinical evaluation. Dietary recommendations in the treatment CPGs often include general guidance recommending the consumption of balanced and varied diet, negative caloric balance, eating at regular times and increasing the intake of fruit and vegetables [3,4,8,10,14]. Regarding meal patterns, some examples of specific recommendations include a consistent meal schedule with 5 structured meals per day at regular intervals, minimizing snacking and avoiding skipping meals [12]. Regarding dietary patterns, CPGs emphasize on a balanced nutrition by including protein, carbohydrates, and healthy fats in every meal, on the consumption of fruits, vegetables, fiber-rich cereals, and low-fat dairy products, as well as on the limitation of high-energy and low-nutrient foods, such as sweetened drinks, fast food, sugary snacks, and sauces [4,8,14]. Other recommendations include the prioritization of water over sugary beverages and the promotion of mindful eating practices, such as reading food labels, encouraging family meals, limiting eating out, and adjusting portions for age [2,10,12]. Regarding physical activity, most treatment CPGs are similar to prevention CPGs and recommend at least 60 minutes of structured physical activity daily [5,8,10,12–14], whereas for sedentary time, most CPGs give general recommendations on reducing the time spent in sedentary behaviors (television viewing, videogaming, internet surfing) [3,4,10,13]. Treatment CPGs also coincide with the prevention CPGs in the limitation of screen time to 1–2 h daily [4,8,12–14]. Regarding adequate sleep duration and quality of sleep, there is a lack of information and specific recommendations in all of the treatment CPGs [2–5,8,10,12–14]. With respect to the pharmacological treatment of childhood obesity, most CPGs are not up-to-date regarding therapeutic options, as they suggest medications such as sibutramine, liraglutide or orlistat, and do not divide recommendations by age groups [4,12,13]. Most of these CPGs agree that weight loss pharmacotherapy should be offered to adolescents 12 years and older with obesity (BMI ≥95th percentile), according to medication indications, risks, and benefits, as an adjunct to behavior and lifestyle treatment [4,12,14]. Some CPGs indicate that bariatric surgery in adolescents is recommended only in extreme cases of severe obesity (BMI ≥ 40 kg/m^2) with significant comorbidities or extreme obesity (BMI ≥ 50 kg/m^2) when intensive lifestyle interventions, with or without drug treatment, have failed for at least six months [3,4,8,12]. The adolescent must have reached Tanner stage 4 or 5 pubertal development and final or near-final adult height. Additionally, the surgery should only be performed in centers with multidisciplinary teams experienced in adolescent bariatric surgery [4,8,10,12]. The guidelines emphasize that surgery is a last resort and should only be considered after all other treatment options have been exhausted.

3.3. Parental Role

Research has shown that involving parents or caregivers in the prevention and treatment of childhood obesity leads to better long-term weight management compared to focusing solely on the child without parental involvement [18,19]. Most CPGs generally mention or encourage a behavior change intervention with parental and/or family involvement, and recognize that the role of the family is crucial to promote a lifestyle that prevents obesity. However, they do not include specific recommendations (diet, sleep, physical activity, family environment) that parents should follow to prevent or treat obesity from home [2,3,6–8,10,13].

Table 1. Comparison of clinical practice guidelines for the prevention and treatment of obesity in children and adolescents.

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Guideline	Assessment				Lifestyle changes			Treatment		Parental role
Focused on Prevention	Weight status	Health status	Mental Health	Diet	Physical activity	Sedentary time	Sleep	Drugs	Surgery	
Canadian clinical practice guidelines on the management and prevention of obesity in adults and children [summary] (2007) **[3]**.	✔	✔	X	✔	✔	✔	X	-	-	✔
Spain. Clinical Practice Guideline for the Prevention and Treatment of Childhood and Juvenile Obesity (2009) **[4]**.	✔	✔	X	✔	✔	✔	X	-	-	✔
Scottish Intercollegiate Guidelines Network:Management of Obesity A national clinical guideline (2010) **[13]**.	✔	✔	X	X	X	X	X	-	-	✔
Canada. Primary Prevention of Childhood Obesity (2nd edition). International Affairs and Best Practice Guidelines. Registered Nurses Association of Ontario	✔	✔	X	✔	✔	✔	X	-	-	✔

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(RNAO) (2014) **[6]**.										
England. National Institute for Health and Care Excellence (NICE). Obesity prevention clinical guideline (2015) **[7]**.	X	X	X	✔	✔	X	X	-	-	✔
European Society of Endocrinology and the Pediatric Endocrine Society (2017) **[8]** .	✔	X	X	✔	✔	✔	✔	-	-	✔
United States. Screening for Obesity in Children and Adolescents: US Preventive Services Task Force Recommendation Statement (2017) **[9]**.	✔	✔	X	✔	✔	✔	✔	-	-	X
Italy. Diagnosis, treatment and prevention of pediatric obesity: consensus position statement of the Italian Society for Pediatric Endocrinology and Diabetology and the Italian Society of Pediatrics (2018) **[10]**.	X	✔	X	✔	✔	✔	✔	-	-	X

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Germany. Current Guidelines for Obesity Prevention in Childhood and Adolescence (2018) **[11]**.	X	X	X	✔	✔	✔	X	-	-	X
Poland. Childhood Obesity: Position Statement of Polish Society of Pediatrics, Polish Society for Pediatric Obesity, Polish Society of Pediatric Endocrinology and Diabetes, the College of Family Physicians in Poland and Polish Association for Study on Obesity (2022) **[12]**.	✔	✔	X	✔	✔	✔	X	-	-	✔
Focused on Treatment	**Weight status**	**Health status**	**Mental Health**	**Diet**	**Physical activity**	**Sedentary time**	**Sleep**	**Pharmacotherapy**	**Surgery**	**Parental role**
Canadian clinical practice guidelines on the management and prevention of obesity in adults and children [summary] (2007) **[3]**.	✔	✔	✔	✔	✔	✔	X	✔	✔	X
Spain. Clinical Practice Guideline for the Prevention	✔	✔	✔	✔	✔	✔	X	✔	✔	✔

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and Treatment of Childhood and Juvenile Obesity (2009) **[4]**.										
Scottish Intercollegiate Guidelines Network:Management of Obesity A national clinical guideline (2010) **[13]**.	✔	✔	✔	✔	✔	✔	X	✔	✔	✔
European Society of Endocrinology and the Pediatric Endocrine Society (2017) [8]	✔	✔	✔	✔	✔	✔	X	✔	✔	X
Italy. Diagnosis, treatment and prevention of pediatric obesity: consensus position statement of the Italian Society for Pediatric Endocrinology and Diabetology and the Italian Society of Pediatrics (2018) **[10]**.	✔	✔	✔	✔	✔	✔	X	✔	✔	✔
Poland. Childhood Obesity: Position Statement of Polish Society of Pediatrics, Polish Society for Pediatric Obesity, Polish Society of	✔	✔	✔	✔	✔	✔	X	✔	✔	✔

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Pediatric Endocrinology and Diabetes, the College of Family Physicians in Poland and Polish Association for Study on Obesity (2022) **[12]**.										
United States. Treatment of Pediatric Overweight and Obesity: Position of the Academy of Nutrition and Dietetics Based on an Umbrella Review of Systematic Reviews (2022) **[2]**.	✔	X	✔	✔	X	X	X	X	X	✔
American Academy of Pediatrics. Executive Summary: Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents with Obesity (2023) **[14]**.	✔	✔	✔	✔	✔	✔	X	✔	✔	X
Italy. Cardiometabolic risk in children and adolescents with obesity: a position paper of the Italian Society for Pediatric Endocrinology	✔	✔	X	✔	✔	✔	X	X	X	X

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and Diabetology (2024) **[5]**.										
***Guidelines that addressed specific or general aspects (✔) Guidelines that did not address specific or general aspects (X)**										

4. Discussion

Obesity in children and adolescents is a significant public health concern worldwide. To address this issue, CPGs for the prevention and treatment of obesity in children and adolescents have been developed. However, these CPGs are very heterogenous between European countries and worldwide and present several gaps and challenges. Heterogenicity in CPGs often leads to inconsistencies in recommendations and confusion to healthcare providers, patients and parents. Specifically, while most guidelines use the same BMI cut-off points to diagnose overweight (≥85th percentile, <95th percentile for age and sex) and obesity (≥95th percentile for age and sex) [3,10], some utilize different cut-off points [4,10,13]. The discrepancies regarding the criteria to define obesity in children and adolescents creates challenges in several areas: accurately diagnosing obesity, conducting clinical studies with comparable results, managing data consistently, and unifying information across European countries and global healthcare systems. To address this, the standardization of BMI cut-off points across Europe and globally is urgently needed. Also, the development and standardization of adipose tissue-focused diagnostic and stratification tools are urgently needed. The suggestion of calculating, plotting, and reviewing a child's or adolescent's BMI percentile at least annually during well-child and/or sick-child medical visits or the suggestion of measuring body weight once a month may be of help to propose in future guidelines as an adequate periodicity for the measurement of these parameters [8]. Current CPGs also lack and age-specific approach in their recommendations and this is crucial for children because of their rapidly changing physiology which in turn affects nutritional needs, the way they respond to medications, and how they engage in physical activity. To address this, there's an urgent need to define and unify age groups globally. This will enable the development of targeted recommendations for assessment and treatment in the areas of diet, physical activity, sedentary behavior, screen time, and sleep. Current review also identified a limited focus on prevention [3–12]. Many CPGs primarily focus on managing established cases of childhood obesity, rather than emphasizing early prevention strategies [2–5,8,10,12–14]. Early intervention is crucial for addressing the root causes of overweight and obesity. When addressing mental health, is important the screening processes to identify mental disorders and referral for a specialist consult in the suspicious of depressive and/or anxious symptoms, dysmorphophobic traits, suicidal risk, and eating disorders. Also it is important to establish the frequency of monitoring psychological symptoms, for example the 'American Academy of Pediatrics Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents With Obesity' recommends to monitor for symptoms of depression in children and adolescents with obesity and conduct annual evaluation for depression for adolescents 12 y and older with a formal self-report tool [14]. Also it is appropriate that the guidelines include parameters on adequate sleep duration and quality of sleep according to age, for example the sleep recommendations of the 'Italian guideline for Diagnosis, treatment and prevention of pediatric obesity': (from 4–12 months: 12–16 h/day; 1–2 years: 11–14 h/day; 3–5 years: 10–13 h/day; 6–12 years: 9–12 h/day; 13–18 years: 8–10 h/day) [10]. Probably the lack of relevant published data has not allowed so far, to provide robust recommendations regarding sleep duration/quality/habits for the preventions and treatment of obesity. Regarding diet related recommendations, some CPGs still lack an age-specific approach regarding portion sizes, quantities, or percentages of macronutrients [3,4,13]. Guidelines should include helpful visuals, such as diagrams and tables, for practitioners, patients, and families. These visuals can illustrate daily servings and provide examples of portion sizes for vegetables, fruits, grains, dairy, and meat [6]. Regarding physical activity, an ideal approach would be to specify recommended exercise duration and intensity levels tailored to each age group. Additionally, providing examples of age-appropriate sports and activities would offer practical support in promoting physical activity. The findings of the present review show that physical activity

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recommendations are usually the same in terms of childhood obesity prevention and treatment or in terms of different age groups. Most CPGs fail to provide examples of developmentally appropriate activities and sports for different age groups [3,4,7,9]. This missing information hinders health service providers and parents in their efforts to promote optimal physical activity and development in children and adolescents. For example, is appropriate an approach like the 'Germany Current Guidelines for Obesity Prevention in Childhood and Adolescence' that recommends children aged 3-5 engage in at least 60 minutes of structured physical activity daily, while those over 3 should have 60 minutes to several hours of unstructured physical activity, limiting inactivity to under 60 minutes at a time (outside of sleep) [11]. Another also recommends that school-aged children and adolescents engage in a minimum of 60 and 90 minutes of moderate to intense physical activity daily, respectively, or achieve at least 10,000 steps per day [11]. Even though obesity is a chronic disease, CPGs may not always provide clear recommendations for long-term follow-up care, which is essential for sustained weight management and overall health. Also, they may not always provide clear recommendations for the frequency to screen for obesity. Clear guidelines on screening and monitoring frequencies for children and adolescents with obesity are vital for maximizing treatment adherence and achieving the best possible health outcomes. Regarding pharmacological treatment and surgery, CPGs suggest they should be considered a last resort for individuals with severe comorbidities who have not responded to lifestyle changes. CPGs should describe pharmacological treatment options based on current scientific information. Bariatric surgery is a last resort for adolescents with severe obesity (BMI ≥40 kg/m^2) and significant comorbidities or extreme obesity (BMI ≥50 kg/m^2) and it should only be performed in specialized centers with multidisciplinary teams experienced in adolescent bariatric surgery. While CPGs often recommend in a general manner involving parents in childhood obesity management, most of them do not provide clear instructions for parents. Some examples of recommendations directed to parents can include prioritizing breastfeeding recommendations for infants [3,4], enriching their diet with nutritious foods, and structuring meals according to healthy eating principles [6,11,12]. Also, parents should ensure their child gets at least 60 minutes of daily physical activity and establish age-appropriate sleep schedules [8,10,12–14]. If necessary, parents should consider family-wide lifestyle changes in diet and exercise to manage weight concerns collectively. Additionally, actively engaging in preventative healthcare and creating a home environment that supports healthy choices are crucial for promoting a child's overall well-being [12]. Finally, to highlight the crucial role of parents in preventing and treating childhood obesity, the guidelines should not only explain the scientific basis for parental participation but also include a dedicated section outlining actionable steps for parents.

5. Conclusions

Addressing the gaps and inconsistencies of current Clinical Practice Guidelines (CPGs) is essential for developing more effective, practical, and evidence-based CPGs in Europe and worldwide. To address childhood and adolescent obesity, it is crucial to incorporate specific, practical recommendations tailored to age groups regarding obesity diagnosis, health status, diet, physical activity, screen time, sleep, treatment options, and parental roles.

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Abbreviations

The following abbreviations are used in this manuscript:

BMI	Body Mass Index
CPGs	Clinical Practice Guidelines
HDL	High-density lipoprotein cholesterol
RNAO	Registered Nurses Association of Ontario
RNAO	United States of America

Appendix 1.

Includes a comparative table with the specific information found of each CPG reviewed. Is included the assessment of obesity (weight status, health status), lifestyle recommendations (diet, physical activity, sedentary behavior, and sleep), treatment (drugs, surgery) and the role of parents/guardians in the prevention/treatment of childhood obesity

References

1. World Health Organization (WHO) Obesity and Overweight Available online: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight (accessed on 23 July 2024).
2. Kirk, S.; Ogata, B.; Wichert, E.; Handu, D.; Rozga, M. Treatment of Pediatric Overweight and Obesity: Position of the Academy of Nutrition and Dietetics Based on an Umbrella Review of Systematic Reviews. *J Acad Nutr Diet* **2022**, *122*, 848–861, doi:10.1016/j.jand.2022.01.008.
3. Lau, D.C.W.; Douketis, J.D.; Morrison, K.M.; Hramiak, I.M.; Sharma, A.M.; Ur, E.; Obesity Canada Clinical Practice Guidelines Expert Panel 2006 Canadian Clinical Practice Guidelines on the Management and Prevention of Obesity in Adults and Children [Summary]. *CMAJ* **2007**, *176*, S1-13, doi:10.1503/cmaj.061409.
4. Spain Ministry For Health And Social Policy Clinical Practice Guideline for the Prevention and Treatment of Childhood and Juvenile Obesity 2009.
5. Valerio, G.; Di Bonito, P.; Calcaterra, V.; Cherubini, V.; Corica, D.; De Sanctis, L.; Di Sessa, A.; Faienza, M.F.; Fornari, E.; Iughetti, L.; et al. Cardiometabolic Risk in Children and Adolescents with Obesity: A Position Paper of the Italian Society for Pediatric Endocrinology and Diabetology. *Ital J Pediatr* **2024**, *50*, 205, doi:10.1186/s13052-024-01767-x.
6. Registered Nurses Association of Ontario (RNAO) Primary Prevention of Childhood Obesity (2nd Edition). International Affairs and Best Practice Guidelines 2014.
7. National Institute for Health and Care Excellence (NICE) Obesity Prevention Clinical Guideline. **2015**.
8. Styne, D.M.; Arslanian, S.A.; Connor, E.L.; Farooqi, I.S.; Murad, M.H.; Silverstein, J.H.; Yanovski, J.A. Pediatric Obesity-Assessment, Treatment, and Prevention: An Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab* **2017**, *102*, 709–757, doi:10.1210/jc.2016-2573.
9. US Preventive Services Task Force; Grossman, D.C.; Bibbins-Domingo, K.; Curry, S.J.; Barry, M.J.; Davidson, K.W.; Doubeni, C.A.; Epling, J.W.; Kemper, A.R.; Krist, A.H.; et al. Screening for Obesity in Children and Adolescents: US Preventive Services Task Force Recommendation Statement. *JAMA* **2017**, *317*, 2417–2426, doi:10.1001/jama.2017.6803.
10. Valerio, G.; Maffeis, C.; Saggese, G.; Ambruzzi, M.A.; Balsamo, A.; Bellone, S.; Bergamini, M.; Bernasconi, S.; Bona, G.; Calcaterra, V.; et al. Diagnosis, Treatment and Prevention of Pediatric Obesity: Consensus Position Statement of the Italian Society for Pediatric Endocrinology and Diabetology and the Italian Society of Pediatrics. *Ital J Pediatr* **2018**, *44*, 88, doi:10.1186/s13052-018-0525-6.
11. Weihrauch-Blüher, S.; Kromeyer-Hauschild, K.; Graf, C.; Widhalm, K.; Korsten-Reck, U.; Jödicke, B.; Markert, J.; Müller, M.J.; Moss, A.; Wabitsch, M.; et al. Current Guidelines for Obesity Prevention in Childhood and Adolescence. *Obes Facts* **2018**, *11*, 263–276, doi:10.1159/000486512.

 doi:10.20944/preprints202502.1628.v1

12. Mazur, A.; Zachurzok, A.; Baran, J.; Dereń, K.; Łuszczki, E.; Weres, A.; Wyszyńska, J.; Dylczyk, J.; Szczudlik, E.; Drożdż, D.; et al. Childhood Obesity: Position Statement of Polish Society of Pediatrics, Polish Society for Pediatric Obesity, Polish Society of Pediatric Endocrinology and Diabetes, the College of Family Physicians in Poland and Polish Association for Study on Obesity. *Nutrients* **2022**, *14*, 3806, doi:10.3390/nu14183806.
13. Scottish Intercollegiate Guidelines Network Management of Obesity. A National Clinical Guideline 2010.
14. Hampl, S.E.; Hassink, S.G.; Skinner, A.C.; Armstrong, S.C.; Barlow, S.E.; Bolling, C.F.; Avila Edwards, K.C.; Eneli, I.; Hamre, R.; Joseph, M.M.; et al. Clinical Practice Guideline for the Evaluation and Treatment of Children and Adolescents with Obesity. *Pediatrics* **2023**, *151*, e2022060640, doi:10.1542/peds.2022-060640.
15. Lobelo, F.; Muth, N.D.; Hanson, S.; Nemeth, B.A.; COUNCIL ON SPORTS MEDICINE AND FITNESS; SECTION ON OBESITY Physical Activity Assessment and Counseling in Pediatric Clinical Settings. *Pediatrics* **2020**, *145*, e20193992, doi:10.1542/peds.2019-3992.
16. Pedersen, J.; Rasmussen, M.G.B.; Sørensen, S.O.; Mortensen, S.R.; Olesen, L.G.; Brønd, J.C.; Brage, S.; Kristensen, P.L.; Grøntved, A. Effects of Limiting Recreational Screen Media Use on Physical Activity and Sleep in Families With Children: A Cluster Randomized Clinical Trial. *JAMA Pediatr* **2022**, *176*, 741–749, doi:10.1001/jamapediatrics.2022.1519.
17. Collings, P.J.; Ball, H.L.; Santorelli, G.; West, J.; Barber, S.E.; McEachan, R.R.; Wright, J. Sleep Duration and Adiposity in Early Childhood: Evidence for Bidirectional Associations from the Born in Bradford Study. *Sleep* **2017**, *40*, zsw054, doi:10.1093/sleep/zsw054.
18. Altenburg, T.M.; Chinapaw, M.J.M.; van der Knaap, E.T.W.; Brug, J.; Manios, Y.; Singh, A.S. Longer Sleep--Slimmer Kids: The ENERGY-Project. *PLoS One* **2013**, *8*, e59522, doi:10.1371/journal.pone.0059522.
19. Jiang, F.; Zhu, S.; Yan, C.; Jin, X.; Bandla, H.; Shen, X. Sleep and Obesity in Preschool Children. *J Pediatr* **2009**, *154*, 814–818, doi:10.1016/j.jpeds.2008.12.043.
20. Wu, Y.; Gong, Q.; Zou, Z.; Li, H.; Zhang, X. Short Sleep Duration and Obesity among Children: A Systematic Review and Meta-Analysis of Prospective Studies. *Obes Res Clin Pract* **2017**, *11*, 140–150, doi:10.1016/j.orcp.2016.05.005.