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Advances in Psychotherapy –
Evidence-Based Practice

Childhood Obesity

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Dorothy J. Van Buren, PhD, retired in 2018 from the position of Associate Professor within the Department of Psychiatry at Washington University in St. Louis School of Medicine. She passed away shortly before publication of this book. For the past 27 years, she had served as a clinical psychologist, supervisor, and researcher in the field of childhood obesity and disordered eating. She is remembered by many for her leadership, compassion, patience, kindness and intelligence. She is dearly missed by her family as well as students, staff, faculty and colleagues. She is survived by her husband, Martin, and her two daughters, Medora and Miranda.

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Preface

This compact desk reference is ideal for busy clinicians who treat pediatric patients with obesity, providing a comprehensive summary of the current state of knowledge and evidence-based recommendations on this important public health concern. Childhood obesity affects one in every six children and as much as one in every five ethnic minority children. Despite its being a widespread affliction, misunderstandings of the origins and resolution of obesity abound. Weight loss gimmicks and health claims oversimplify weight gain and appeal to desperate families by offering pseudoscience and quick fixes that don't work. In reality, obesity develops from a number of complex and varied environmental, genetic, and psychological factors, which present differently between individuals. Successful treatment of the pediatric patient is also complex, requiring time-intensive, evidence-based care delivered by a multidisciplinary team. In the following chapters, the reader will find the most current scientific understanding of obesity and be equipped to help guide patients to appropriate and effective treatment modalities.

The book is divided into five chapters. The first chapter defines obesity and describes the prevalence both globally and in the US. A report of the consequences of untreated obesity as it tracks into adulthood, and the associated physical and psychosocial comorbidities, is provided. In this chapter, the reader will also find the current definitions and methods used to screen for childhood obesity. Chapter 2 explores the theoretical models of the causes of obesity, including behavioral causes such as eating behaviors and physical inactivity; appetitive traits such as impulsivity, motivation to consume palatable food, and satiety responsiveness; environmental causes such as the family and built environments; and genetic influences. A discussion of behavioral economics and its relevance to the adoption of treatment strategies is also included. In Chapter 3, diagnostic criteria and individual and familial factors that are predictive of weight loss treatment are provided. Chapter 4 describes current treatment guidelines and approaches to treatment including family-based treatment, social facilitation maintenance, pharmacotherapy, and surgical procedures. In particular, a family-based treatment method is outlined which is best supported by the evidence and which meets the recommendations of the American Academy of Pediatrics, US Preventive Services Task Force, and other organizations. Clinicians can use the copyable resources provided in the Appendix to initiate this recommended treatment strategy: a sample session outline; self-monitoring forms to track eating, sleeping, and activity behaviors; and a tool to evaluate socioenvironmental contexts to facilitate individualized treatment planning. The reader will also find a discussion of prevention strategies, current understanding of the mechanisms of action for successful outcomes, and the efficacy of and prognosis for multicomponent behavioral interventions. Problems that may arise in treatment implementation and multicultural issues are also described. Chapter 5 provides a detailed case vignette of a 12-year-old girl and her mother.

The book can be read cover-to-cover or as a reference manual to fulfill an immediate need to identify specific information. Because of the complex nature of obesity, treatment is fraught with challenges. These challenges require a persistent and focused team effort. Patients require education, social support, behavioral and family therapy, and in some cases medical supervision. The multicomponent treatment protocol is intensive, but the health and psychosocial benefits can last a lifetime.

Dedication

Dedicated to the children, families, and interventionists who participated in obesity research trials. Without you there would be no evidence upon which to base our treatments.

Acknowledgments

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John R. Best and Jodi Cahill Holland would like to thank their professional mentors for their guidance and support.

Dorothy Van Buren, who sadly passed away shortly before the publication of this book, expressed her gratitude for the loving support of her husband, Martin West, and daughters, Medora and Miranda, during the writing of this book.

The authors wish to acknowledge the research and clinical teams, including Mackenzie Brown, for invaluable help in compiling this book and for providing insightful observations over the years.

Contents

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Description

1.1 Terminology

Obesity is not currently included in the *Diagnostic and Statistical Manual of Mental Disorders,* 5th edition (DSM-5; American Psychiatric Association, 2013). Deliberations for inclusion were allowed because of the body of evidence documenting associations and similar behaviors and brain patterns, between obesity and many other psychiatric disorders. However, the Eating Disorders Work Group of the task force concluded that there is insufficient evidence to include obesity in the DSM-5, because of the heterogeneity observed across the condition and the incompletely understood etiology (Marcus & Wildes, 2012). In contrast, obesity is formally recognized as a disease by the American Medical Association (Pollack, 2013) and the Obesity Society (Allison et al., 2008).

1.2 Definition

The World Health Organization (WHO) defines *overweight* and *obesity* as "abnormal or excessive fat accumulation that may impair health" (World Health Organization, 2014). Identification of children with excess weight is a challenge due to the influences of child age, sex, pubertal status, and race/ethnicity on body composition. To account for these factors and the growth rate in children, the US Centers for Disease Control and Prevention (CDC) and the WHO have developed age- and sex-specific growth charts, which were updated in 2000 and 2006, respectively (Borghi et al., 2006; Kuczmarski et al., 2002). Definitions for obesity in childhood have been issued by the WHO (de Onis et al., 2007), CDC (Kuczmarski et al., 2002), and International Task Force on Obesity (IOTF) (Cole, Bellizzi, Flegal, & Dietz, 2000) (Table 1).

Child BMI is used to identify overweight and obesity in children

Child weight status is determined first by calculating *body mass index* (BMI), defined as a child's weight in kilograms divided by the child's height in meters squared, and second, by comparing the child's current BMI with the age- and sex-specific reference values. IOTF cutoffs are based on combined international reference data from Brazil, Great Britain, Hong Kong, The Netherlands, Singapore, and the US (Cole et al., 2000) and are not intended for clinical use. More information regarding the use of BMI in the identification of child overweight and obesity is provided in Section 1.7.

Table 1
Definitions of Childhood and Adult Overweight and Obesity

Source	Age	Overweight	Obese	Underweight
CDC	2–19	BMI ≥ 85th percentile and < 95th percentile	BMI ≥ 95th percentile	BMI < 5th percentile
WHO	0–5	BMI > 2 standard deviations above the WHO growth standard median	BMI > 3 standard deviations above the WHO growth standard median	BMI < 2 standard deviations below the WHO growth standard median
WHO	5–9	BMI > 1 standard deviation above the WHO growth standard median	BMI > 2 standard deviations above the WHO growth standard median	BMI < 2 standard deviations below the WHO growth standard median
International Obesity Task Force[a]	2–18	International age- and sex-specific BMI cutoff points that correspond to the adult definition of ≥ 25 BMI	International age- and sex-specific BMI cutoff points that correspond to the adult definition of ≥ 30 BMI	International age- and sex-specific BMI cutoff points that correspond to the < 18.5 or < 17 BMI adult criteria are suggested, but these points need validation
CDC, WHO	Adults	25.0 ≤ BMI ≤ 29.9	BMI ≥ 30.0 **Subcategories** Grade 1: BMI 30–35 Grade 2: BMI 35–40 Grade 3: BMI ≥ 40	BMI < 18.5

Note. Body mass index (BMI) is defined as weight in kilograms divided by height in meters squared. CDC = US Centers for Disease Control and Prevention; WHO = World Health Organization.
[a]Not intended for clinical use.

intervention to promote breakfast consumption in adolescents with overweight or obesity who were regular breakfast skippers. They found that adolescents who were instructed to consume a high-protein breakfast (35 g protein) reported less daily hunger and greater reductions in daily calorie intake than those adolescents who continued to skip breakfast. Further fat mass gain was prevented in the high-protein breakfast group over the course of the 12-week intervention.

Breakfast is an important health behavior, with benefits that extend beyond weight management

Breakfast consumption is an important health behavior, with benefits that extend beyond weight management. Families receiving weight loss treatment should be informed of the benefits of a healthy breakfast and provided with strategies to address common barriers to breakfast consumption.

2.2 Contributions of Child Physical Inactivity and Sedentary Behaviors to Obesity

The AAP recommends limiting children's entertainment screen time < 1–2 hrs/day

Increased rates of sedentary behaviors and decreased participation in physical activities in children and adolescents may also be primary contributors to the high rates of childhood obesity. More than half of 9- to 13-year-olds do not participate in any organized physical activities (CDC, 2003; Cooper et al., 2015). The American Academy of Pediatrics (AAP) recommends that entertainment screen time should be limited to less than 1–2 hrs per day for children 2–18 years old (Council on Sports Medicine and Fitness & Council on School Health, 2006). The American Heart Association recommends that all children aged 2 and older should participate in at least 60 min of enjoyable, moderate to vigorous physical activities every day that are developmentally appropriate and varied. See Table 6 for a summary of recommendations for different age groups.

2.3 Role of Appetitive Traits in Childhood Obesity

Appetitive traits are stable behavioral patterns associated with food consumption

In the context of childhood obesity, *appetitive traits* refer to stable behavioral phenotypes related to dysregulated eating and food consumption that promote a positive energy balance (Wilfley et al., 2010). Key among these are impulsivity (mentioned previously in Section 1.6.2 "Psychosocial Comorbidities"), satiety responsiveness, and a motivation to consume palatable foods (van den Berg et al., 2011). Research suggests that these traits may be heritable, likely due to shared genetic and environmental factors between parents and children that influence the development and maintenance of these appetitive traits (Epstein, Paluch, Beecher, & Roemmich, 2008).

Table 6
Recommendations for Physical Activity in Children From the American Academy of Pediatrics

Age group	Recommendations
Infants and toddlers	• No television for children under the age of 2 years • Allowed to develop enjoyment of outdoor physical activity and unstructured exploration with responsible adult caregiver (i.e., walking or unorganized free play outdoors)
Preschool (4–6 years old)	• Limit screen time to < 2 hrs per day • Free play should be encouraged with emphasis on fun, playfulness, and exploration (i.e., running, swimming, tumbling, throwing, catching)
Elementary School (6–9 years old)	• Free play should continue to be encouraged, involving more sophisticated movement patterns with emphasis on fundamental skill acquisition (walk, dance, jump rope) • Organized sports should have flexible rules and short instruction time • Allow free time in practices and focus on enjoyment rather than competition • Co-ed participation is not contraindicated, as few differences between sexes exists
Middle School (10–12 years)	• Preferred physical activities that focus on enjoyment should be encouraged • Skill development and factors that promote continued participation are needed • Placement for contact and collusion sports should be based on maturity rather than chronological age • Weight training may be initiated, with low weight and high repetitions
Adolescents	• Identify activities that are of interest and fun, and include friends • Enrollment in competitive sports should be based on size and ability rather than chronological age

Based on Council on Sports Medicine and Fitness & Council on School Health, 2006. Available at http://pediatrics.aappublications.org/content/pediatrics/117/5/1834.full.pdf

2.3.1 Impulsivity

The concept of impulsivity was mentioned briefly in the context of externalizing behavior (Section 1.6.2 "Psychosocial Comorbidities"). Here its specific role in controlling appetitive behavior is discussed. Impulsivity refers to a diminished ability to resist immediate temptations that stand in conflict with future outcomes or long-term goals. For example, for a child in a weight management program, choosing to eat a piece of cake may be conceptualized as an impulsive behavior because it conflicts with a long-term goal (i.e., lose

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Treatment

4.1 Methods of Treatment

4.1.1 Treatment Guidelines

The AAP has issued guidelines for the treatment of obesity in children

Organizations and agencies such as the US Preventive Services Task Force (USPSTF) and the AAP have issued guidelines or recommendations for the prevention and treatment of obesity in children (Barlow & Expert Committee, 2007; O'Connor et al., 2017). Additionally, numerous comprehensive reviews and meta-analyses have documented the effectiveness of multicomponent weight loss interventions for children that are of sufficient duration (i.e., greater than 25 hrs of contact), that include a multicomponent focus on diet and physical activity, and that use behavioral change techniques (Janicke et al., 2014; Ho et al., 2012). This chapter provides a brief overview of family-based behavioral weight loss treatments (FBTs) for childhood obesity.

4.1.2 Family-Based Treatment

FBTs are consistent with national treatment guidelines

FBTs, developed and expanded upon by Leonard Epstein, Denise Wilfley, and colleagues (Epstein, Paluch, Roemmich, & Beecher, 2007; Wilfley et al., 2007; Wilfley, Saelens, et al., 2017), are consistent with USPSTF and AAP guidelines for treatment of childhood obesity and have demonstrated efficacy in both the short and long term. Modification of energy balance behaviors (i.e., decreasing caloric intake and increasing caloric expenditure) is the cornerstone of many weight loss interventions, including FBT. These goals are achieved through the use of behavioral treatment techniques and the active involvement of a parent or caregiver who often also has overweight or obesity. Appendix 1 provides a brief outline reminder for how to conduct a typical FBT session.

In FBT, the parent is encouraged to modify their own energy balance behaviors, to provide support and encouragement for the child involved in treatment, and to engineer a home environment conducive to a healthy lifestyle for the entire family. It is this focus on change across the entire household that is a hallmark of FBT. Evidence suggests that extended treatment contact focusing on both the continued practice of self-regulatory behavioral skills and the use of family and social networks to support weight loss maintenance behaviors such as improved dietary intake and engagement in increased levels of physical activity is important to the long-term maintenance of weight lost during FBT.

Diet

Dietary targets of FBT include decreasing caloric intake, improving the nutritional quality of foods selected, and shifting food preferences. Decreases in caloric intake of approximately 500 kcal per day from baseline, for a total of 1,000–1,200 kcal per day for children and 1,200–1,400 kcal per day for adults, are achieved by decreasing consumption of high-energy-dense, unhealthy foods, and increasing consumption of nutritious, low-energy-dense foods.

Color-Code Your Food, Make Healthier Choices

Traffic light method provides family-friendly way to categorize foods and make healthier choices

A family-friendly method of categorizing foods according to traffic light colors is used in FBT to help families identify which foods to decrease (Red foods – stop and think; Yellow foods – proceed with caution by watching portion sizes), and which to increase (Green foods – Go!) (Figure 1). Red foods are calorically dense and/or have limited nutritional value (e.g., potato chips, candy, SSBs). Yellow foods are more calorically dense than Green foods but may be more nutritious than Red foods (e.g., whole grain bread), and most vegetables are considered Green foods. The *traffic light* method has helped people change their eating habits, resulting in their choosing more healthful foods (Levy, Riis, Sonnenberg, Barraclough, & Thorndike, 2012; Thorndike, Sonnenberg, Riis, Barraclough, & Levy, 2012; Thorndike, Riis, Sonnenberg, & Levy, 2014).

An important feature of FBT is that caloric reduction is not the only dietary goal; shifting taste preferences is also extremely important. To this end, foods that are modified to be lower in calories (e.g., foods with sugar substitutes such as diet soft drinks, low-fat cookies) are still considered Red foods despite their lower caloric content. The goal of FBT is for families to make a shift to more nutritious foods and not to switch from one "junk" food to a lower calorie version of the same food. In FBT, parental weight loss success predicts child weight loss, and this correlation can be explained, at least in part, by parental maintenance of lower Red food intake over time.

RED
Stop and think
YELLOW
Slow down, caution
GREEN
Go! Best choice

Figure 1
The traffic light method to categorize foods based on their nutritional quality. (Adapted from Epstein & Squires, 1988)

Another method utilized in FBT for improving the nutritional quality of food and decreasing caloric intake is to encourage families to eat fewer meals away from the home. The average family in the US eats approximately 35% of their meals away from home, and children who have overweight or obesity eat a higher proportion of their meals away from home than children who do not have overweight or obesity. FBT's focus on the reduction of the number of meals eaten away from home has a positive impact not only on participants' weight status but also on the nutritional quality of the foods they eat.

Physical Activity

Physical activity targets in FBT include increasing moderate-to-vigorous physical activity while decreasing time spent in sedentary, non-school or work-related pursuits. The colors of the traffic light again provide a family-friendly way of understanding an activity's intensity or metabolic equivalent (MET). For example, Green activities (Go!) are 5.0 METs or higher; Yellow activities (Slow) are between 3.0 and 4.9 METs, while Red activities (Stop) are less than 3.0 METs. Watching TV, playing video games, talking or texting on the phone, and playing games or "surfing" the Internet on the computer are all Red activities. Any time spent on screen-time activities for a purpose, such as for work or homework, are not counted against Red activity time. Target goals for moderate-to-vigorous physical activity are 60–90 min per day for adults and children. However, FBT also emphasizes the importance of lifestyle physical activities as useful substitutes for sedentary pursuits. For example, walking to the store rather than driving, not only involves more physical activity than driving, but is also more time consuming, thus leaving less time for engaging in computer games or TV watching. Since sedentary activities are often accompanied by eating, decreasing time spent in sedentary pursuits has the added benefit of decreasing caloric intake in addition to increasing caloric output.

FBT targets increases in moderate-to-vigorous physical activity and decreases in sedentary pursuits

Behavior

FBT is a behavioral treatment and the use of behavioral techniques for facilitating change is integral to its successful implementation. Self-monitoring, goal setting, successive approximation and shaping, modeling, and reward systems are the mainstays of good behavioral therapy and are all components of FBT. Self-monitoring has been associated with better weight outcomes in children as well as in adults, and because of this association, it has long been considered one of the most important behavioral change techniques in weight loss interventions. See Appendix 2 for an example of a self-monitoring form that may be adapted and modified for use with children of different developmental levels as well as for use with their parents. Contrary to traditional self-monitoring, which involves recording behaviors after they have occurred, pre-planning is a form of self-monitoring that involves planning or scheduling meals and physical activity a priori. Preplanning may be particularly useful for children with higher impulsivity because it allows families to determine ahead of time how they plan to improve their dietary quality and to increase physical activity. Part of the process of preplanning is developing methods for dealing with potential challenges or barriers to achieving the desired healthy lifestyle behaviors. Appendix 3 offers an example of self-monitoring forms useful in helping families preplan.

FBT is a behavioral intervention

Self-monitoring has been associated with better weight outcomes in children

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Case Vignette

This case vignette is adapted with permission from "Little Big Kids: We Have the Tools to Combat Childhood Obesity, But Lack the Will of Implementation," by E. E. Fitzsimmons-Craft & D. E. Wilfley, 2015, May 8. Available online at *The Common Reader,* http://commonreader.wustl.edu/c/little-big-kids

By the age of 12 years, Amber, who was an only child and lived with her mother, Veronica, had already struggled with the psychosocial and behavioral effects of obesity for several years. Amber was teased remorselessly by peers at school. She felt down about herself and lonely much of the time, and she had a very negative body image. She avoided changing clothes in the school locker room or exposing her body in public. Despite participating on the basketball team at her school, Amber felt completely isolated. She would come home right after school or basketball practice and watch TV and eat sweets and other easily accessible junk food. Because of this pattern, Amber was often up late, scrambling to finish homework.

Nearly everyone in Amber's family struggled with obesity, including her mother. Amber's mother was a single parent who juggled two jobs while raising her daughter. She felt overburdened, isolated, and alone. Pressured by her work schedule, Veronica, frequently sleep deprived, found herself picking up fast food for dinner and stocking the home with easy-to-grab snack foods. Veronica lacked the time, energy, or any sense of incentive, to plan and prepare home-cooked meals. When she did have a spare moment, she found herself watching TV and eating foods such as chips and cookies to unwind from her hectic day. Given her own habits and feelings of guilt for not having enough time for Amber, it was hard for Veronica to say no to Amber when she requested fast food, or to set limits with her about bedtime.

Despite the fact that Amber had struggled with the effects of excessive weight for many years, Veronica was first informed that her daughter's weight was in the obese category and that she was at high risk for the development of type 2 diabetes, at Amber's 12-year-old check-up. Veronica was shocked to learn that the problem was so critical and was upset that her daughter's pediatrician had not warned her sooner. Veronica was given some educational materials on childhood obesity, nutrition, and physical activity; however, she did not have a plan or strategy to help her daughter achieve a healthier weight. She felt despair and anger that she had somehow failed as a parent. Fortunately, Amber's pediatrician also referred Amber and her mother to a university-based clinical trial testing weight control interventions for children and their families.

For Amber and Veronica, the family-based behavioral treatment they participated in ultimately helped them to reduce unhealthy habits associated with

Planned Meals

Day: _____ Date: ____/____/_____

Time/Hour Awake: _____ Time/Hour Fell Asleep: _____

Breakfast – Planned Time:	Amount	Calories	RED	GREEN
TOTAL BREAKFAST				
Lunch – Planned Time:	Amount	Calories	RED	GREEN
TOTAL LUNCH				
Dinner – Planned Time:	Amount	Calories	RED	GREEN
TOTAL DINNER				

Time	**Snacks –** Planned	Amount	Calories	RED	GREEN
	TOTAL SNACKS				
	TOTAL DAY				

Planned GREEN Physical Activity: _____ Min _____

Pretreatment Assessment

Family ID _____ Interviewer _____ Date ___/___/_____

PARENT – Model of Support Strengths and Areas for Improvement Assessment

Therapist introduction to the assessment: "I would like to ask you some questions about your child's habits, your family and home environment, your child's friends, and the community in which you live, in each of the domains of the Model of Support. In our treatment program, we will focus on these levels (your child, your family, your child's peer network, and the surrounding community), as in each phase of treatment, there are things in those that can make it easier or harder to keep up with healthy eating and activity behaviors. We will identify strengths for your child and areas that could be improved in each level to help you and your child build permanent healthy eating and activity habits."

1. Self Environment

A. Eating Behaviors – Some people have certain traits that make them more vulnerable to having irregular eating patterns and overeating. These are called appetitive traits, and they can have a significance influence on weight. Does your child have any difficulty in the following areas?

		Never	Rarely	Sometimes	Often	Almost always
1.	Child engages in sneak eating behaviors	0	1	2	3	4
2.	Child has a hard time stopping eating once they start	0	1	2	3	4
3.	Child keeps eating even though they are full or have had enough	0	1	2	3	4
4.	Child feels badly about the amount of food they eat	0	1	2	3	4
5.	Child skips meals to avoid eating too much food	0	1	2	3	4
6.	Child continues to ask for and seek out opportunities to eat RED foods	0	1	2	3	4
7.	Child gets angry or frustrated when only healthy options are available or offered	0	1	2	3	4
8.	Child "grazes" on food throughout the day	0	1	2	3	4
9.	Child struggles with having smaller portions of foods	0	1	2	3	4