BEHAVIOR MANAGEMENT FOR THE TREATMENT OF CHILDHOOD OBESITY IN
THE PRIMARY CARE SETTING: A GUIDE FOR NURSE PRACTITIONERS

By

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The members of the committee appointed to examine the research requirements and manuscript of CAROL J. THAMERT find it satisfactory and recommend that it be accepted.

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Behavior Management for the Treatment of Childhood Obesity in the Primary Care Setting: A Guide for Nurse Practitioners

Abstract

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Purpose

The purpose of this article is to explore the current recommendations for comprehensive treatment of childhood obesity in the primary care setting.

Data sources

The data sources used for this article include a literature review using Cinahl and Proquest Medical Library and selected clinical articles and websites from professionally recognized pediatric health care organizations.

Conclusions

Pediatric experts recommend combining health promotion with behavior modification therapy in order to motivate overweight children and families to make behavior choices that lead to establishing and maintaining a healthy weight.

Implications for Practice

Matching treatment approaches to the child’s stage of change/motivation has been shown to improve treatment outcomes.

Key words

Childhood obesity, assessment, management, recommendations, behavior management
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Introduction

“During the 20th century, the leading causes of mortality and morbidity in the United States (US) shifted from infectious diseases to chronic diseases.” The incidence of chronic diseases among children such as obesity, diabetes, and cardiovascular disease has increased dramatically over the past 30 years (Centers for Disease Control and Prevention [CDC], 2004, p. 1; Hedley et al., 2004; Yach, Hawkes, Gould, & Hofman, 2004).

Childhood obesity, which is of epidemic proportions in the United States, has been declared a public health crisis among children in the US due to an alarming increase in its prevalence (United States Department of Health & Human Services [USDHHS], 2001). The rise in childhood obesity is strongly associated with the current trends in the diet and activity patterns of children that inhibit a child’s ability to maintain a balance between calories consumed and energy expended (Booth et al., 2001; Ebbeling, Pawlak, & Ludwig, 2002; French, Story, & Jeffery, 2001; St-Onge, Keller, & Heymsfield, 2003).

Childhood obesity is a multifactorial disease with serious health implications. Overweight children have a higher incidence of weight-related health complications, such as hypertension, dyslipidemia, glucose intolerance, insulin resistance, and type 2 diabetes that can continue into adulthood (American Academy of Pediatrics, Committee on Nutrition [AAP-CON], 2003; Ebbeling et al., 2002). “The probability of childhood obesity persisting into adulthood is estimated to increase from approximately 20% at 4 years of age to approximately 80% by adolescence” (AAP-CON p. 425). Weight-related health complications are major risk factors for premature death and disability later in life (AAP-CON). “Approximately 400,000 deaths each year in the United States are attributable to physical inactivity and poor nutrition” (CDC, 2004, p. 17).
Health care costs related to obesity are astonishing (Wang & Dietz, 2002). In the US, during 1997-1999, the annual hospital costs related to obesity were $127 million, up from $35 million during 1979-1981 (Wang & Dietz). “In 2000, the total cost of obesity in the US was estimated to be $117 billion, of which $61 billion was for direct medical costs and $56 billion was for indirect costs” (CDC, 2003, ¶ 2).

Many health care providers have limited knowledge, skills, and self-efficacy related to the comprehensive management of childhood obesity in the primary care setting (Barlow & Dietz, 2002). The goal of treatment is to help overweight children achieve a healthy weight through healthy nutrition and physical activity behaviors (AAP-CON, 2003; Barlow & Dietz, 1998, 2002; CDC, 2002). Successful management is dependent upon early identification and evaluation of overweight children and enhanced by implementation of appropriate behavior management strategies that help overweight children reach these goals (AAP-CON; O’ Brien, Holubkov, & Reis, 2004).

**Epidemiology**

Nearly one-third of all US children are overweight or at risk of becoming overweight and 16% are overweight (Federal Interagency Forum on Child and Family Statistics [FIFCFS], 2004). Childhood obesity increased 45% from the 1988-1994 National Health and Nutrition Examination Survey (NHANES) to the 1999-2002 NHANES and is more than three times the Healthy People 2010 target of 5% (Hedley et al., 2004; Ogden, Flegal, Carroll, & Johnson, 2002; Strauss & Pollack, 2001). The number of overweight children 6-11 years of age more than doubled and the number of overweight adolescents 12-19 years of age more than tripled from the 1976-1980 survey data to the 1988-1994 survey data (Hedley et al.; Ogden et al.; Strauss & Pollack).
In developed countries, the incidence of childhood obesity is growing fastest among the urban poor due to limited access to affordable healthy nutrition and physical activity options (Ebbeling et al., 2002). In developing countries where both undernutrition and overnutrition exist, the incidence is growing fastest among the upper socioeconomic strata, as they begin to adopt a western lifestyle. In the US, the incidence is growing fastest among minority groups.

Other subgroups of children also have an increased prevalence of obesity (Haas et al., 2003; Hedley et al., 2004). Among boys and girls of all ages and races, Hispanic White children have the highest prevalence of childhood obesity. Among all children 6-19 years of age, boys have a higher prevalence of obesity than girls. Among all children, adolescents 12-19 years of age have a higher incidence than children 6-11 years of age. Among males, the prevalence is higher among Hispanic White children. Among girls, the prevalence is higher among African American children.

According to the Pediatric Nutrition Surveillance 2001 Report, which also included Native American, Alaska Native, Asian, and Pacific Islander children, among children 2-5 years of age, the prevalence is higher among girls than boys (Polhamus et al., 2003). Native American and Alaska Native children have higher incidences of overweight than Non-Hispanic White, African American, Asian, or Pacific Islander children.

Etiology

Although overweight and obesity are ultimately caused by a positive balance between intake and expenditure (Moran, 1999), the exact pathophysiology is not well understood (Berry, Galasso, Melkus, & Grey, 2004; Ebbeling et al., 2002). The rapid increase in overweight children is likely attributable to a combination of an individual’s genetic makeup, health
behaviors, and exposure to specific external environmental influences (Berry et al.; Maffeis 1999, Moran; Segal, Sanker, & Reed, 2004).

**Endogenous Factors**

There is a strong association between childhood obesity and heredity (Maffeis, 1999; Moran, 1999; Segal et al., 2004). The prevalence of childhood obesity is higher among children with one or more parents who are overweight or obese (Holcomb, 2004). The risk of becoming overweight as adults has been shown to be three times higher, if a child had one overweight parent and ten times higher if both parents were overweight (AAP-CON, 2003; Holcomb).

Genetic and hormonal defects can cause an individual to gain excessive amounts of body fat, but account for a relatively small proportion of overweight children (Moran, 1999; Segal et al., 2004). Some common genetic and hormonal defects associated with overweight and obesity are Prader-Willi, Bardet-Biedl, Alstrom, Cohen, Turners, familial lipodystrophy, hypothyroidism, hypercortisolism, and primary hyperinsulinism (AAP-CON, 2003; Ebbeling et al., 2002; Moran). Children with genetic or hormonal syndromes are usually of short stature (< 5th percentile of height for age), have mental impairment, delayed bone age, and a family history of obesity (Moran; Mullen & Shield, 2004).

Research has also identified five genetic variants that affect metabolism and predispose an individual to becoming overweight (Segal et al., 2004). Four genes are associated with hypothalamic and pituitary disorders: (a) leptin, (b) leptin receptor, (c) prohormone convertase 1 (PC1), and (d) pro-opiomelanocortin (POMC), and one gene is associated with a non-syndromic phenotype of morbid obesity: (e) the melanocortin-4 receptor (MC4-R) (Segal et al.).
Exogenous Factors

Many social and physical environmental factors have influenced the nutrition and physical activity patterns of children (Booth et al., 2001; Dennison, Erb, & Jenkins, 2002; Ebbeling et al., 2002; French et al., 2001; St-Onge et al., 2003). According to the 2003 Youth Risk Behavior Surveillance, almost 80% of young people do not eat the recommended servings of fruits and vegetables, 60% of children exceed the recommended daily allowance of saturated fat, 33% do not engage in the recommended amount of moderate or vigorous physical activity, and only 28% participate in daily physical education classes (CDC, 2005a; CDC, 2005b).

Children who have diet and activity patterns that inhibit their ability to maintain a balance between calories consumed and energy expended have an increased risk of developing childhood obesity (AAP-CON, 2003; Booth et al., 2001; Dennison et al., 2002; Ebbeling et al., 2002; French et al., 2001; Mullen & Shield, 2004; St-Onge et al., 2003). Patterns that increase a child’s risk of becoming overweight include: (a) consuming excessive amounts of foods high in calories from refined carbohydrates and saturated fats such as sugar-sweetened drinks, convenience foods, and fast foods, (b) eating a limited amount of fruits, vegetables, whole grains, milk or milk products, and lean meats, (c) skipping meals, (d) spending an increased amount of time engaging in sedentary leisure-time activities such as watching TV or playing video games, and (e) spending less time engaging in daily physical activity (Booth et al.; Dennison et al.; Ebbeling et al.; French et al.; Mullen & Shield; St-Onge et al.).

Health Consequences

Associated Medical Risks

Childhood obesity is a multisystem disease with serious health implications that can become chronic, continue into adulthood, and be passed from generation to generation (AAP-
Medical conditions associated with childhood obesity include hypertension, dyslipidemia, insulin resistance syndrome, exercise intolerance, asthma, obesity hypoventilation syndrome, obstructive sleep apnea syndrome, Pickwickian syndrome, type 2 diabetes, impaired glucose tolerance, polycystic ovary disease, hirsutism, acne, acanthosis nigricans, precocious puberty, early menarche, hypogonadism, slipped capital femoral epiphysis, Blount's disease, forearm fracture, arthritis, flat feet, cholecystitis, choledolithiasis, pancreatitis, non-alcoholic steatohepatitis, glomerulosclerosis, pseudotumor cerebri, recurrent headaches, yeast/fungal skin infections, and striae atrophicae (AAP-CON; Ebbeling et al., 2002; Hagarty, Schmidt, Bernaix, & Clement, 2004; Mullen & Shield, 2004).

Associated Psychosocial Risks

Many people consider childhood obesity to be a socially unacceptable childhood disorder. This attitude puts overweight or obese children at risk for psychological and social adjustment disorders. Overweight children are more likely to have a lower perceived quality of life (Schwimmer, Burwinkle, & Varni, 2003). Overweight children report lower perceived competencies in social, athletic and appearance domains, as well as self worth. Even without comorbidities, severely overweight children have a similar lower quality of life as described by children who have cancer. Overweight children are often subjected to social teasing and stereotyping as unattractive, unhealthy, academically unsuccessful, socially inept, unhygienic, and lazy. As a result, overweight children are more likely to experience eating disorders, poor self-esteem, poor self-image, and depression (sadness, loneliness, nervousness, and high-risk behaviors).
Clinical Manifestations

Overweight or obese children are frequently seen in the primary care setting for acute medical and psychological complications associated with obesity, but are more likely to come to the clinic for periodic well-child examinations, sports physicals, or acute medical conditions unrelated to obesity (Berry et al., 2004; CDC, 2002; Hagarty et al., 2004). Children should be evaluated for childhood obesity at each clinic visit (AAP-CON, 2003; Barlow & Dietz, 1998, 2002; CDC, 2002; O'Brien et al., 2004).

Comprehensive Medical Evaluation

Initial Screening

An initial screening (Table 1) is performed to identify children who are overweight or at risk of becoming overweight (Barlow & Dietz, 1998, 2002). Every child should be screened and evaluated because successful management is dependent upon early identification and treatment (AAP-CON, 2003; Barlow & Dietz, 1998, 2002; CDC, 2002; O'Brien et al., 2004).

Second-Level Assessment

A second level assessment (Table 1) is performed to identify additional risk factors for obesity and other chronic diseases (Barlow & Dietz, 1998, 2002; CDC, 2002).

In-Depth Medical Assessment

An in-depth medical assessment (Table 1) is performed to identify underlying factors that contribute to the development of childhood obesity, determine the severity of overweight, identify risk factors for developing secondary complications, and develop appropriate weight and treatment goals (Barlow & Dietz, 1998, 2002; CDC, 2002). The physical exam focuses on signs of potential health consequences associated with childhood obesity and on underlying
comorbidities (Barlow & Dietz, 2002; CDC, 2002; Mullen & Shield, 2004). For example, a blurred optic disk margin could be a sign of pseudotumor cerebri and a central body fat distribution, which is evaluated by measuring waist circumference, is a risk factor for cardiopulmonary disease (Hagarty et al., 2004; Mullen & Shield).

Management

A multidisciplinary team approach comprised of disciplines from medicine, nursing, nutrition, exercise physiology, and psychology is essential for appropriate management of childhood obesity in the primary care setting (Berry et al., 2004). Conventional approaches focus on establishing and maintaining a healthy weight through gradual weight loss (Mullen & Shield, 2004). Aggressive approaches focus on improving or resolving serious weight-related health complications, such as obstructive sleep apnea or slipped capital femoral epiphysis that require rapid weight loss (Mullen & Shield). Aggressive approaches should only be performed by specially trained pediatric obesity providers.

The family plays a critical role in a child’s contextual environment including emotional, personal, cognitive, and behavioral development, which has a significant influence on the child’s attitudes, styles, practices, and preferences toward nutrition, physical activity, and leisure time/sedentary activity (Golan & Crow, 2004; Mullen & Shield, 2004; St. Jeor, Perumean- Chaney, Sigman-Grant, Williams, & Foreyt, 2002). Treatment approaches that involve the child and family, encourage focusing on the family instead of the individual child, and focusing on behaviors instead of personal traits significantly increase the family’s motivation and self-efficacy towards making positive behavior choices and changing maladaptive behaviors (Epstein, Meyers, Raynor, & Saelens, 1998; Golan & Crow; Mullen & Shield; St. Jeor et al.).
Comprehensive family-based behavioral interventions have shown sustained weight loss maintenance (Kirk, Scott, & Daniels, 2005).

Treatment recommendations include providing children and families with easy-to-learn nutrition and physical activity principles, tips, and advice (Table 2) including the benefits of healthy nutrition and activity behaviors (Table 3) (Barlow & Dietz, 1998, 2002; CDC, 2002). Providing overweight children and families with education alone is not always enough to get them to initiate healthy eating and activity behaviors, so it is imperative to include both health promotion and behavior modification in the treatment plan (Drohan, 2002; Kirk, et al., 2005). Motivational Interviewing and behavior modification techniques have been shown to be effective in helping children and families establish and maintain healthy behaviors (Drohan; Golan & Crow, 2004; Kirk et al.; Mullen & Shield, 2004; St. Jeor et al., 2002).

**Treatment Goals**

Treatment goals and plans should be developed from information gathered from the comprehensive medical evaluation and tailored to the individual child and family (Barlow & Dietz, 1998, 2002; CDC, 2002; Kirk et al., 2005; Mullen & Shield, 2004; Ryan, Skinner, Farrell, & Champion, 2001). Things to consider in tailoring the plan are the child and family’s age, gender, race, culture/religion, developmental level, physical ability, academic level, personal characteristics, preferences and learning styles, socioeconomic status, geographic location, stage of change, motivational level, and impediments to change (Barlow & Dietz, 1998, 2002; CDC, 2002; Kirk et al.; Mullen & Shield; Ryan et al.). The overall goal of treatment is to provide the child and family with the necessary knowledge, support, skills, and motivation to make informed health behavior changes that lead to establishing and maintaining healthy nutrition and physical activity behaviors (AAP-CON, 2003; Barlow & Dietz, 1998, 2002; CDC, 2002; Mullen &
Goals should be individualized and challenging, yet realistic, attainable, and measurable (Kirk et al.). Short-term goals focus on making behavior changes and long-term goals focus on weight management (Mullen & Shield). New goals should be introduced one at a time after previous goals have been mastered (Mullen & Shield).

Weight goals vary according to the child’s age, BMI value, and status of health complications (Barlow & Dietz, 1998; CDC, 2000). The algorithm in (Table 4) describes the process for determining whether a child needs health promotion and weight maintenance or health promotion and weight loss (Barlow & Dietz, 1998, 2002).

Health behavior goals include, but are not limited to, eating well-balanced healthy meals that support growth and development, engaging in at least 60 minutes of physical activity per day, and limiting sedentary activity to less than 2 hours per day (AAP-CON, 2003; Barlow & Dietz, 1998, 2002; Berry et al., 2004; CDC, 2002; Epstein et al., 1998; Epstein et al., 2001; Epstein, Paiuch, Gordy, & Dorn, 2000; Hagarty et al., 2004; Kirk et al., 2005; Mullen & Shield, 2004).

Behavior Management

Health Behavior

Health behavior is an intricate process in which individuals move back and forth between various stages of developing and changing individual patterns, actions, and habits that relate to health maintenance, restoration, and improvement (Mullen & Shield, 2004). Individuals form and change behaviors based on their personal beliefs, feelings, expectations, motives, values, perceptions, and experiences within the environment (Glanz, Rimer, & Lewis, 2002). Health behaviors can be adaptive and lead to emotional and physical wellbeing or maladaptive and contribute to distress and disease (Freeman & Freeman, 2005). Changing behavior related to a
health problem such as childhood obesity can be difficult because of the many variables that can affect treatment outcomes (Bundy, 2004; Kirk et al., 2005). Overweight children often find it challenging to commit to recommended treatment plans, because of the complexity of behavior change (Epstein et al., 1998).

According to the Stages of Change Model, individuals move back and forth between various stages of change and corresponding levels of motivation or ambivalence to change (Bundy, 2004; Freeman & Freeman, 2005; Mullen & Shield, 2005). Motivation is a dynamic interpersonal interaction between an individual and his or her environment creating an intrinsic state of readiness and intent to change (Freeman & Freeman; Mullen & Shield). Many factors such as an individual’s personal beliefs underlying change, perceived value of change, perceived costs, benefits, and barriers to change, and self-efficacy toward change can affect an individual’s motivation to initiate and maintain behavior change (Bundy). It may take an individual several attempts before making permanent changes because change is a non-linear path of progressing toward new behaviors, then relapsing back to old behaviors, then progressing forward, and so on (Lange & Tigges, 2005).

The Modified Motivation to Change Scale (Table 5) and Revised Stages of Change Model (Table 6) are proposed clinical tools designed to evaluate a family’s stage of change and level of motivation to make positive health behavior change (Freeman & Freeman, 2005; Mullen & Shield, 2005). The tools were adapted from the Revised Stages of Change (Freeman & Freeman), the Freeman Motivation Scale (Freeman & Freeman), and the Stages of Change-A model for Nutrition Counseling (Mullen & Shield). The tools address the stages of change and level of motivation that individuals go through when making behavior changes specific to nutrition and physical activity and the corresponding treatment strategies that are more likely to
influence positive behavior change in that specific stage (Bundy, 2004; Lange & Tigges, 2005; Rollnick & Miller, 1995). The scale includes an objective list of thoughts or behaviors that a family might exhibit in each stage, and the corresponding counseling focus and behavior change strategies recommended for each stage. The list is grouped in 10 sets of 10-point scales that are used to assess and rate a family’s perceived level of motivation to make health behavior changes on a scale of 0-10, with 10 being the most motivated and 0 being completely non-motivated.

**Framework for Treatment**

The Theory of Cognitive Behavior Therapy as an extension of the Roy Adaptation Model (CBT/RAM) provides a systematic framework for providing supportive, family-centered, goal-oriented, health behavior management to overweight children in the primary care setting (Freeman & Freeman, 2005). The theory integrates concepts from the Roy Adaptation Model of nursing into the Theory of Cognitive Behavior Therapy of psychotherapy to maximize the effectiveness of the therapeutic treatment process.

Cognition refers to the thought processes that an individual uses to formulate their own set of beliefs, values, and rules for living and influences the development of the specific set of behaviors they will display in response to stimuli within their environment (Freeman & Freeman, 2005; Wisotsky & Swencionis, 2003). Cognitive behavior therapy is a form of psychotherapy that examines and evaluates a person’s cognitions and behaviors (Freeman & Freeman). Cognitions are the way a person constructs and understands the world and behaviors are the processes by which a person acts on those cognitions (Freeman & Freeman). The Roy Adaptation Model guides the nursing process of evaluating an individual from the context of how he or she is adapting to the environment, to setting goals and implementing appropriate interventions (Freeman & Freeman).
The framework uses cognitive behavior therapy to guide the nursing process of evaluating and treating overweight children and families (Freeman & Freeman, 2005). The goal of therapy is to appropriately identify and evaluate the behaviors and environmental factors thought to contribute to or maintain obesity and develop an effective treatment plan to modify these factors.

**Behavioral Counseling Style**

Motivational interviewing (MI) is a supportive, directive style of cognitive behavioral therapy designed to assist individuals in exploring and resolving their ambivalence or resistance to health behavior change (Bundy, 2004; Kirk et al., 2005; Lange & Tigges, 2005; Mullen & Shield, 2004; Rollnick & Miller, 1995). Most of the research on the efficacy of MI has been in the field of substance abuse (Bundy; Kirk et al.; Lange & Tigges). MI has not been well studied in children, but available evidence supports that MI is safe and effective in producing at least short-term improvement in children's nutrition and physical activity habits and weight status (Kirk et al.). MI should be used in conjunction with other behavior modification techniques to enhance the long-term sustainability of behavior change (Bundy).

Treatment outcomes significantly improve when an individual participates proactively in the treatment process; however, motivation to change cannot be forced upon an individual (Rollnick & Miller, 1995). Resistance to change cannot be considered a character flaw because motivation is not a personal characteristic and an individual has the freedom to choose to change or live with the consequences of not changing (Rollnick & Miller). Trying to persuade an individual who is not ready to change or rush a client who is progressing slowly will most likely result in resistance (Rollnick & Miller). Matching treatment strategies and techniques to an
individual’s stage of change and level of motivation (Tables 5 and 6) improves treatment outcomes (Bundy, 2004; Kirk et al., 2005; Lange & Tigges, 2005).

When a provider recognizes that an individual is expressing ambivalence or resistance, the provider can use motivational strategies and techniques (Table 7) to help the individual clarify his or her beliefs, thoughts, behaviors, and other factors that may be influencing or impeding the individual’s motivation to change (Bundy, 2004; Kirk et al., 2005; Lange & Tigges, 2005; Mullen & Shield, 2004). The provider should establish rapport with the client and evaluate the client’s impediments to change (Table 8), level of motivation (Table 5), and stage of change (Table 6) (Bundy; Kirk et al.; Lange & Tigges). The provider should help the individual develop a personal agenda for the treatment process, develop discrepancies between the current situation and the ideal situation, identify ambivalence or resistance, sharpen the focus, and cultivate self-efficacy (Bundy; Kirk et al.; Lange & Tigges). The provider should direct the client in developing an individualized treatment plan (Mullen & Shield).

The provider should avoid giving unidirectional information, advice, or helpful suggestions without presenting all sides of the story and encouraging the client to make their own choices (Bundy, 2004; Lange & Tigges, 2005; Mullen & Shield, 2005). The provider should encourage the individual to recognize and resolve his or her resistance, but should avoid counterproductive communication styles that tend to trigger negative responses (Bundy; Lange & Tigges; Mullen & Shield). Behavior change often occurs naturally once ambivalence is resolved; however, individuals often need additional behavioral management skills (Table 9) to be able to change their behavior (Bundy; Lange & Tigges; Mullen & Shield; Rollnick & Miller).
Clinical Tools

Many innovative strategies and clinical tools for health promotion and behavior counseling specific to childhood obesity are available for patients and health professionals. Table 10 contains a list of additional resources for information on childhood obesity, promotion of healthy nutrition and physical activity behaviors, and behavior management strategies, techniques, and clinical tools.

Implications for Nursing

Overweight children frequently visit primary care clinics for various weight-related and non weight-related issues. Nurse Practitioners are, therefore, in a unique position to provide comprehensive treatment to overweight children and families in the primary care setting. Current recommendations for the treatment of childhood obesity include providing a supportive, family-centered, goal-oriented approach to promotion of positive nutrition and physical activity behaviors and modification of maladaptive behaviors. It is essential that Nurse Practitioners learn and keep up-to-date on the current recommendations in order to assist overweight children and families in obtaining the necessary skills, resources, and support for making meaningful health behavior choices/changes. The Theory of Cognitive Behavior Therapy as an extension of the Roy Adaptation Model is a promising framework to guide Nurse Practitioners in using cognitive behavior management to enhance the treatment process. Motivational interviewing is a promising counseling style that works well with the CBT/RAM model, especially for children who are not ready or motivated to make behavior changes. Matching treatment strategies and techniques to an individual’s stage of change and level of motivation has been shown to improve treatment outcomes.
Conclusions

Childhood obesity is a critical threat to the health of US children. Many approaches to prevention and management have been introduced over the past decade. Due to the inability to treat childhood obesity effectively, the epidemic continues to grow. Healthy nutrition and physical activity behaviors have been shown to decrease a child’s risk of becoming overweight and to help a child who is overweight to establish a healthy weight and prevent or slow the progression of secondary health consequences associated with obesity. Health behavior change is a complex process. Many barriers inhibit children’s ability to establish and sustain healthy behaviors. Many practitioners feel they lack the knowledge and confidence needed to provide effective treatment or to help children overcome barriers to treatment. Family-centered treatment approaches that include health promotion and cognitive behavior management significantly increase a child/family’s motivation and self-efficacy towards making positive behavior choices that lead to establishing and maintaining a healthy weight.
References


Table 1

**Essentials of the Comprehensive Medical Evaluation - Childhood Obesity**

**Initial Screening**

1. Measure child’s height and weight and calculate body mass index
   a. If BMI is between 75th - 85th % - provide health promotion and have child return in 1 yr
   b. If BMI is between 85th to 94th % - perform second level assessment
   c. If BMI ≥ 95th % - perform an in-depth assessment

**Second-Level Assessment**

1. Measure child’s skinfold thickness to verify elevated BMI is due to excess body fat
   a. If skinfold thickness ≥ 95th % - child has excess fat

2. Screen the child for the following obesity-related risk factors
   a. Family history of cardiovascular disease, HTN, diabetes, or parental obesity
   b. HTN-National High Blood Pressure Education Program screening guidelines
   c. Elevated cholesterol-National Cholesterol Education Program screening guidelines
   d. An elevated blood glucose-ADA guidelines for testing for Type-2 diabetes in children
   e. Psychological issues from being overly concerned about the child’s weight or perception of self as being overweight
   f. A change in BMI ≥ three BMI points within the last year

3. If negative for risk factors - provide health promotion and have child return in 1 year

4. If positive for risk factors - perform an in-depth assessment

**In Depth Medical Assessment**

1. Comprehensive Personal and Family History
   a. Growth and development patterns
2. Behavioral Assessment
   a. Nutrition and physical activity behavior questionnaires, 24-hour food and activity recall, food and activity frequency questionnaire, and daily food and activity diary from Bright Futures in Practice-Nutrition and physical activity series available at http://www.brightfutures.org/inpractice.html
   b. Modified Motivation Scale (Table 5) and Revised Stage of Change Scale (Table 6)
   c. Impediments to Change Scale (Table 8)
3. Complete Physical Examination (PE)
   a. Medical
   b. Psychosocial
4. Laboratory and Diagnostic Testing and Specialized Medical or Psychosocial Referrals
   a. Based on the initial screening, assessment, and in-depth medical evaluation
   b. Follow the National High Blood Pressure Education Program hypertension guidelines
   c. Follow the National Cholesterol Education Program guidelines for hyperlipidemia
   d. Follow the American Diabetes Association guidelines for Type-2 diabetes in children
   e. Test for metabolic and genetic disorders only if sufficient evidence is found on PE

Note. Information obtained from Barlow & Dietz, 1998, 2002; Berry et al., 2004; CDC, 2000, 2002; Freeman & Freeman, 2005; Hagarty et al., 2004; Mullen & Shield, 2004.
Table 2

**Nutrition and Physical Activity Counseling Principles, Tips, and Advice**

Keep it Easy!

Use simple terminology appropriate to age, development, and culture. Encourage small incremental steps. Use a combination of “hands on” activities, visual aids, and pre-printed materials. Make recordkeeping easy. Identify and reduce impediments to change. Verify child/family’s interpretation of lessons to avoid misunderstandings such as portion distortion.

Make it Real!

Personalize information by focusing on child/family not general population. Match interventions to Modified Stages of Change Scale and Revised Stage of Change Model. Develop realistic, achievable goals and treatments that are supported by family and peers, and compatible with the individual’s lifestyle. Provide “hands-on” learning experiences and opportunities to practice.

Keep it Positive!

Provide a supportive, nonjudgmental environment appropriate for counseling children and families of all ages, cultures, and backgrounds. Assess the child/family’s knowledge and build on positive aspects. Encourage and reinforce commitment with positive reinforcement and reciprocal contracting. Offer empathy and constructive feedback. Focus on positives and reinforce successes.

Make it a Family Deal!

Focus on the family not the child. Enlist the family as active participants and role models, and for support and reinforcement. Encourage child/family to take responsibility for
changing behaviors. Encourage family to eat healthy “family meals” at the table, engage in “family physical activities”, and offer a variety of healthy foods and opportunities for physical activity.

Teach the Basics and Build on the Child/Family’s Knowledge Base/Skills:

- Eat a variety of foods from all five major food groups.
- Balance food intake with regular physical activity and emphasize moderation to avoid overnutrition and undernutrition.
- Increase intake of fresh fruits and vegetables, whole grains, low fat milk/milk products, lean meats/beans/legumes, and water.
- Limit fat intake to 30% of total calories.
- Limit intake of foods high in sugar, which have a high glycemic index.
- Limit foods eaten in fast food establishments, convenience stores, and vending machines.
- Select physical activities that match developmental, physical, and psychosocial abilities.
- Engage in at least 60 minutes of physical activity on most days, preferably on all days—may split into several 10-15 minute sessions interspersed throughout the day.
- Decrease the amount of time spent watching TV or engaging in other sedentary activities to less than 2 hours per day.

Note. Information obtained from Bright Futures in practice: Nutrition and physical activity. Series available at http://www.brightfutures.org/inpractice.html. See Table 9 for additional resources.
Table 3

Benefits of Healthy Nutrition and Physical Activity Behaviors

- Increases physical fitness
- Helps build and maintain healthy skin, bones, muscles, and joints
- Helps maintain growth and development
- Helps achieve and maintain weight loss and prevent weight gain
- Builds lean muscle and helps reduce body fat
- Lowers risk for cardiovascular disease, colon cancer, and type 2 diabetes
- Helps control blood pressure
- Promotes psychological well-being and self-esteem
- Reduces feelings of depression and anxiety

Note. Information obtained from CDC, 2005a, 2005b.
Table 4

Algorithm for Selecting Appropriate Weight Goals - Childhood Obesity

Select an appropriate weight goal

For a child 2-7 years

If BMI is between 85th - 94th % - provide health promotion and weight maintenance

If BMI ≥ 95th %

With no complications - provide health promotion and weight maintenance

With complications - provide health promotion and weight loss

For a child ≥ 7 years

If BMI is between 85th - 94th %

With no complications - provide health promotion and weight maintenance

With complications - provide health promotion and weight loss

If BMI ≥ 95th % - provide health promotion and weight loss

Note. Information adapted from Barlow & Dietz, 1998 p. 7, Fig 2.
<table>
<thead>
<tr>
<th>Score</th>
<th>Stage</th>
<th>Thinking/behavior process</th>
<th>Treatment goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0-10)</td>
<td>Anticontemplation</td>
<td>Does not want to change or to discuss the issue.</td>
<td>Resolve ambivalence/resistance to change.</td>
</tr>
<tr>
<td>(11-20)</td>
<td>Noncontemplation</td>
<td>Is unaware of problem &amp; hasn’t thought about change.</td>
<td>To become aware of need to change.</td>
</tr>
<tr>
<td>(21-30)</td>
<td>Precontemplation</td>
<td>Does not intend to take action in next 6 months.</td>
<td>Personalize behavior, its risks, &amp; benefits.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Increase awareness of need to change.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Resolve ambivalence/resistance.</td>
</tr>
<tr>
<td>(31-40)</td>
<td>Contemplation</td>
<td>Intends to take action within next 6 months but is not committed.</td>
<td>Increase self-efficacy &amp; motivation to change. Resolve ambivalence/resistance</td>
</tr>
<tr>
<td>(41-50)</td>
<td>Action planning</td>
<td>Intends to take action within the next 30 days &amp; has taken some behavioral steps.</td>
<td>Commit to change. Cultivate self-efficacy &amp; increase motivation to change.</td>
</tr>
<tr>
<td>(51-60)</td>
<td>Action</td>
<td>Successfully making behavior changes &lt; 6 months.</td>
<td>Commit to change.</td>
</tr>
<tr>
<td>(61-70)</td>
<td>Prelapse</td>
<td>Has thoughts of reverting to old behaviors.</td>
<td>To increase self-efficacy towards prevention.</td>
</tr>
</tbody>
</table>

Table 5

*Modified Motivation to Change Scale – Childhood Obesity*
<table>
<thead>
<tr>
<th>Score</th>
<th>Stage</th>
<th>Thinking/behavior process</th>
<th>Treatment goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>(71-80) Lapse</td>
<td>Has reverted to old behavior 1-5 times.</td>
<td>To identify &amp; modify thoughts, behaviors, &amp; factors that led to lapse. To increase self-efficacy/motivation towards returning to positive behaviors.</td>
<td></td>
</tr>
<tr>
<td>(81-90) Relapse</td>
<td>Has had a series of lapses or has reverted to old behavior.</td>
<td>To identify &amp; modify thoughts, behaviors, &amp; factors that led to relapse. To increase self-efficacy/motivation towards starting change process again.</td>
<td></td>
</tr>
<tr>
<td>(91-100) Maintenance</td>
<td>Has sustained behavior change for ≥ 6 months.</td>
<td>Reinforce commitment to continue positive behaviors. Encourage support system.</td>
<td></td>
</tr>
</tbody>
</table>

Note. A proposed clinical tool adapted from Freeman & Freeman, 2005, p. 126-129, Tables 5.2 and 5.3; & Mullen & Shield, 2004, p. 110, Table 8.2. Scores range from 0-100 and represent rater’s opinion of family’s level of motivation to make changes. Individuals in range 0-10 would be least likely to initiate or sustain change. Individuals in range 90-100 would be most likely to maintain changes.
<table>
<thead>
<tr>
<th>Stage</th>
<th>Change strategy</th>
<th>Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticontemplation</td>
<td>Create supportive climate for change. Offer information &amp; support.</td>
<td>Provide contact numbers for resources. Establish rapport, brief tailored messaging, removing barriers, handling resistance, developing discrepancies.</td>
</tr>
<tr>
<td>&amp; Non-contemplation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contemplation</td>
<td>Identify maladaptive behaviors, barriers to change &amp; possible solutions. Prioritize behaviors to change. Discuss change process, treatment process, &amp; strategies.</td>
<td>Discuss behavioral management techniques. Cultivate self-efficacy, brief tailored messaging, &amp; removing barriers.</td>
</tr>
<tr>
<td>Stage</td>
<td>Change strategy</td>
<td>Technique</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Action planning</td>
<td>Help patient conceptualize issue (expectations, beliefs, attitudes), develop goals, &amp; design treatment plan. Encourage small steps to change &amp; using support system. Assist with learning behavioral management.</td>
<td>Setting the agenda, goal setting, reciprocal contracting, cue management, reinforcement, sharpening the focus, removing barriers, cultivating self-efficacy, problem-solving/cop ing</td>
</tr>
<tr>
<td>Stage</td>
<td>Change strategy</td>
<td>Technique</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Plan frequent follow-up to support changes. Reinforce use of behavior modification techniques. Encourage, praise, &amp; offer support to client &amp; support system.</td>
<td>Reinforcement, cue management, problem solving, coping, &amp; relapse prevention. Discus preventing &amp; coping with lapses &amp; relapses.</td>
</tr>
</tbody>
</table>

Note. A proposed clinical tool adapted from Freeman & Freeman, 2005, p. 126-129, Tables 5.2 and 5.3; and Mullen & Shield, 2004, p. 110, Table 8.2. Scores range from 0-100 and represent the rater’s opinion of the family’s level of motivation to make behavior changes. Individuals in range 0-10 would be considered least likely to initiate or sustain change. Individuals in range 90-100 would be considered most likely to maintain the changes.
Table 7

<table>
<thead>
<tr>
<th>Motivational Interviewing Strategies/Techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting the Agenda</td>
</tr>
<tr>
<td>Process used to help an individual identify his or her treatment expectations, set and prioritize realistic, achievable goals, and design a treatment plan for achieving the goals.</td>
</tr>
<tr>
<td>Assessing Readiness to Change</td>
</tr>
<tr>
<td>Process used to assess an individual’s readiness or level of motivation to make positive health behavior change and tailoring behavior management strategies accordingly.</td>
</tr>
<tr>
<td>Cultivating Self-Efficacy</td>
</tr>
<tr>
<td>Process used to increase an individual’s self-efficacy by encouraging the individual to counteract negative self-talk with self-motivating statements such as positive affirmations.</td>
</tr>
<tr>
<td>Removing Barriers to Change</td>
</tr>
<tr>
<td>Process used to identify and resolve factors that may be impeding an individual’s ability to make positive health behavior changes.</td>
</tr>
<tr>
<td>Brief Targeted Messages</td>
</tr>
<tr>
<td>Process used to design and provide essential information to a certain population in a particular setting in as brief a period as possible. Often used for individuals who are not interested in or are ambivalent towards treatment.</td>
</tr>
<tr>
<td>Developing Discrepancies</td>
</tr>
<tr>
<td>Process used to help an individual conceptualize the difference between current beliefs, thoughts, and behaviors and desired goals.</td>
</tr>
</tbody>
</table>
Sharpening the Focus

Process used to divide a problem into specific factors and behaviors that contribute to and maintain the issue.

Handling Resistance

Process used to challenge an individual’s resistance without eliciting an argument or further resistance.

Shifting the Focus

Process used to redirect the discussion in order to explore the beliefs underlying an individual’s resistance.

Note. Information obtained from Bundy, 2004; Lange & Tigges, 2005; Mullen & Shield, 2004; Rollnick & Miller, 2005.
### Table 8

**Improved Impediments to Change Scale - Childhood Obesity**

<table>
<thead>
<tr>
<th>Patient Factors</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Personal characteristics that inhibit an individual’s ability to make healthy behavior choices or change ineffective behaviors</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>• Lack of knowledge and/or confidence regarding the therapeutic process</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>• Limited or restricted self-monitoring skills (monitor daily food intake, make good food choices, judge portion sizes, and detect when stomach is full)</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>• Not ready or motivated to make behavior changes</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>• Negative attitude towards past or present treatment experiences or failures</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>• Fear of changing one’s actions, thoughts, or feelings</td>
<td>0 1 2 3 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Practitioner Factors</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Insufficient knowledge, skills, or experience with therapeutic process</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>• Limited ability to establish a collaborative relationship with patient</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>• Limited ability to motivate a child to comply with treatment</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>• Lack of flexibility and creativity regarding the therapeutic process</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>• Lack of ability to select interventions according to child’s Modified Motivation Scale</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>• Negative attitude towards past or current treatment experiences or failures</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>• Fear of changing one’s actions, thoughts, or feelings</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>Disorder Factors</td>
<td>Significance</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>• Clinical manifestations that inhibit child’s ability to make healthy behavior</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>choices or ability to change ineffective or maladaptive behaviors</td>
<td></td>
</tr>
<tr>
<td>• Comorbidities that inhibit child’s ability to make healthy food choices or</td>
<td>0 1 2 3 4</td>
</tr>
<tr>
<td>engage in physical activities</td>
<td></td>
</tr>
</tbody>
</table>

| Environmental Factors                                                          |              |
| • Inadequate support network or a network that sabotages therapy process        | 0 1 2 3 4    |
| • Parents who are overweight or model nutrition and activity attitudes and      | 0 1 2 3 4    |
| styles that encourage weight gain                                               |              |
| • Parental educational level, socioeconomic status, and cultural/religious     | 0 1 2 3 4    |
| preferences                                                                     |              |
| • Availability of foods high in calories from sugar/refined carbohydrates      | 0 1 2 3 4    |
| and saturated fats                                                             |              |
| • Availability of opportunities to engage in sedentary activities              | 0 1 2 3 4    |
| • Inadequate access to school health and physical education programs           | 0 1 2 3 4    |
| • Inadequate access to safe and affordable healthy food and physical activities| 0 1 2 3 4    |

Note. Proposed clinical tool adapted from Freeman & Freeman, 2005 p. 130, Figure 5.1. Scores range from 0-4 and represent the provider’s opinion on the importance of each factor to the problems being encountered in treatment. 0 = No importance; 1 = Some importance; 2 = Moderate importance; 3 = Great importance; 4 = Major impediment.
Table 9

*Behavior Modification Strategies/Techniques*

**Self-Monitoring**

Process used to bring about behavior changes by monitoring caloric intake and energy expenditure to identify behaviors that encourage poor nutrition and sedentary activity.

**Goal Setting**

Process used to increase a child/family’s motivation/commitment by giving them a sense of ownership through setting their own goals.

**Reciprocal Contracting**

Process used to reinforce the child/family’s motivation/commitment by developing and signing a written contract with each other outlining the specific behaviors the child will carry out in return for specific activity/privilege-related rewards. Self-imposed or given by family.

**Positive Reinforcement**

Process used to reinforce positive behaviors and discourage negative behaviors. Must be consistent and directed at behaviors not personal attributes. Self-imposed or given by family.

**Cue Management**

Process used to teach children self-direction and problem-solving skills in order to develop alternate coping responses for high-risk situations, to modify environmental triggers, and to increase opportunities for physical activity and healthy eating.

**Long-Term Maintenance and Prelapse/Lapse/Relapse Prevention**

Process used to help the child/family to anticipate, identify, and use problem-solving skills to prevent or recover from prelapses/lapses/relapses.

*Note. Information obtained from Mullen & Shield, 2005.*
Table 10  

*Additional Resources*

**Clinical Tools**

Assessment and care plan template, treatment contract template, daily food and activity diary, 24-hour food-recall form, and food frequency questionnaire are available in the book—Mullen, M., & Shield, J. (2004). *Childhood and adolescent overweight: The health professional's guide to identification, treatment, and prevention.* Chicago, IL: American Dietetic Association.

Bright Futures in Practice-Nutrition and physical activity series available at http://www.brightfutures.org/inpractice.html


**Additional Nutrition and Physical Activity Information**


ADiA-Food and nutrition information website  
http://www.eatright.org/Public/NutritionInformation/92.cfm

ADiA-Healthy habits for healthy kids available at:  
http://www.eatright.org/Public/Files/wellpoint.pdf


Food guide pyramid for young children available at:  

NIHBLI-Portion distortion quiz  
http://hin.nhlbi.nih.gov/portion/portion.cgi?action=question&number=1

NIH-We can! Parent handbook available at:  

Physical activity guide pyramid for kids available at:  
http://www.healthsource.org/shophs/listcat/listcat.cfm?catid=1