

# Integrative Treatment of Pediatric Obesity: Psychological and Spiritual Considerations

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## Abstract

This article presents an integrative approach to the problem of pediatric obesity, which is a multifaceted medical condition that is epidemic in the United States and elsewhere in the world. In this article, definitions of *pediatric obesity* are provided, and its prevalence, etiological factors, medical complications, and comorbidities are reviewed. Psychological and spiritual

factors associated with pediatric obesity are discussed, together with their importance to integrative treatment. This review suggests that the use of psychological interventions, such as cognitive behavioral therapy (CBT) and animal-assisted therapy (AAT), can be considered in conjunction with medical and educational interventions to treat pediatric obesity successfully.

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Medical practitioners working with children and adolescents invariably encounter overweight and obese patients. This article provides a general overview of *pediatric obesity*, including the way in which it is defined; the etiological factors associated with the disorder; its medical complications and comorbidities; and recommendations for effective, holistic, and clinical treatment. Growing evidence shows that the successful treatment of pediatric obesity requires consideration not only of medical issues but also of psychological and social-environmental factors. Special emphasis is given to the psychological and spiritual aspects of pediatric obesity in the context of a holistic perspective.

## The Epidemic of Pediatric Obesity

*Obesity* is typically defined in terms of some calculation of estimated body fat. Although many methods can be used to estimate body fat, body mass index

(BMI)—a weight-to-height ratio ( $\text{wt}/\text{ht}^2$ )<sup>1</sup>—is the most prevalent and can be used in any pediatric practice to evaluate body fat for children aged older than 2 years.<sup>2,3</sup> The Centers for Disease Control regards BMI higher than the 95th percentile as indicative of a child being overweight and BMI higher than the 85th percentile as predictive of a high risk of becoming overweight in the future.<sup>4</sup> However, the American Medical Association and the American Academy of Pediatrics have comparatively harsher thresholds, with children having a BMI higher than the 95th percentile being identified as obese and a child having a BMI higher than the 85th percentile being identified as overweight (ie, not merely at risk of becoming overweight in the future).<sup>5,6</sup>

Changes in the global food system appear to be one of the major contributors to the rise of the epidemic of global obesity.<sup>7,8</sup> Specifically, an increase in low-cost, high-calorie foods; improved food distribution systems that made high-calorie food more accessible and convenient; and more persuasive and pervasive food marketing have all played a role.<sup>9</sup> Studies have shown that the rise in the availability of high-calorie foods was in itself more than sufficient to explain the rise in obesity in the United States in the 1970s and 1980s.<sup>10,11</sup> Data suggest that a shift to higher-calorie foods also occurred at this time, increasing caloric intake and weight in US adults and children.<sup>8</sup> Since then, many middle- and low-income countries have emulated high-income countries, such as the United States, joining the global surge in the prevalence of obesity in adults and children.<sup>12</sup> Globally, an estimated 1.48 billion

adults are overweight (BMI > 25), 502 million adults are obese (BMI > 30),<sup>12</sup> and an estimated 180 million children are overweight or obese.<sup>13</sup>

Nearly 32% of children and adolescents in the United States are considered overweight, with a BMI higher than the 85th percentile.<sup>14</sup> Approximately 17% of children and adolescents in the United States have a BMI that is at or higher than the 95th percentile.<sup>14</sup> Given this high prevalence of pediatric obesity, the development of recommendations regarding the prevention, assessment, and treatment of children who are overweight or obese has been an important focus for practitioners.<sup>15</sup> Equally important has been an emerging international consensus on clinical guidelines for the management of childhood obesity in primary care.<sup>16</sup> It is critical to address problems of children being overweight or obese early in life because childhood obesity is an important predictor of adult obesity and morbidities.<sup>17</sup>

### **Etiological Factors**

Understanding biological and environmental factors in relation to patterns of eating and physical activity are critical to preventing and treating pediatric obesity.

### **Biological Factors**

Biochemical factors have been identified in pediatric obesity, such as (1) body composition (eg, body weight, BMI, and body fat); and (2) metabolic and hormonal parameters (eg, levels of leptin, ghrelin, glucose, and insulin).<sup>18</sup> More than 200 genes, gene markers, and chromosomal regions have been associated with childhood obesity<sup>18</sup> as have hormones, such as ghrelin, which is involved in weight regulation and stimulation of food intake, and the neurotransmitter neuropeptide Y, which is involved in food intake.<sup>18-20</sup> The hypothalamus and caudal brainstem appear to play roles in establishing homeostasis in the body, whereas brain areas in the limbic system and cortex are implicated in the ways in which contextual, social, and emotional forces affect eating behavior.<sup>19</sup>

Studies of twins suggest genetic factors strongly affect BMI and explain variations among individuals, yielding stronger correlations for parents and their biological offspring than for adoptees and adoptive parents.<sup>21</sup>

Prenatal factors such as in utero exposure to glucocorticoids, protein restrictions, maternal diet and obesity, gestational diabetes mellitus, and birth weight have been associated with metabolic syndrome in childhood and with childhood obesity.<sup>20,22,23</sup> Genetic factors, such as taste acquisition and preference, eating in the absence of hunger in infancy and early childhood, and patterns of weight gain in middle childhood and adolescence have been identified as factors in onset of pediatric obesity.<sup>23</sup>

Obtaining a thorough background and history for a patient's family can place the circumstances of a child becoming overweight or being obese in context, providing valuable information for treatment.

### **Environmental Factors**

In addition to biological factors, many environmental factors, including sociocultural and psychological factors, have been shown to influence weight status and gain.<sup>24,25</sup> Environmental factors are broadly construed, encompassing a child's lifestyle, level of physical activity, availability of unhealthy food choices and diet, and the family's social climate and ethnic culture. Related psychological aspects of pediatric obesity include access to and use of new recreational technologies (eg, texting or playing games on cell phones) and social media (eg, Facebook or Twitter).

**The Built Environment.** The built environment has been identified as a determinant of obesity, with important effects on individual behaviors and overall rates of child and adult obesity.<sup>8,26-39</sup> Although the built environment is unlikely to have been as important in spawning the global epidemic as changes in the global food system, the ways in which people have responded to the built environment (eg, decreased walking and biking spaces and increased traffic congestion) have changed with time.<sup>8</sup>

Urban neighborhoods with a higher housing density, fewer parks, or a greater risk of crime provide fewer opportunities for safe, unsupervised outdoor play or for family-oriented physical activities, such as walking or cycling.<sup>28-34</sup> Parental fears about neighborhood safety tend to increase indoor sedentary activity.<sup>35-39</sup> Socioeconomic factors also play a significant role in physical activity and eating behavior.<sup>40</sup> Poorer urban neighborhoods have more fast-food outlets and fewer supermarkets and farmers' markets selling nutritious foods, effectively restricting children's access to healthier eating options.<sup>28</sup>

Support for obese children and adults, to enable them to cope with these limitations of the built environment, continues to be an important public health goal, requiring interventions and policies addressing the obesogenic nature of environments.<sup>8</sup> When treating pediatric obesity, it is essential to consider the limitations imposed by a child's social and physical environment and the ways in which these factors constitute barriers to weight loss.

**Physical Inactivity.** Regular exercise is beneficial for maintaining normal weight.<sup>41</sup> Recently, a decrease in physical activity has been shown to be correlated with a rise in pediatric obesity.<sup>42-44</sup> Parents' obesity and levels of physical activity predict a risk for being overweight among their children before age 7 years.<sup>45</sup> Decreased physical activity (eg, lack of participation in sports) may also influence weight gain, particularly for children who are already overweight or obese. Overweight and obese children are less likely to participate in exercise and sports, increasing the likelihood that they will remain overweight.<sup>46</sup> Children who are obese, compared with their normal-weight peers, report that sedentary behaviors, such as watching television, provide more positive reinforcement than physically active behaviors.<sup>47</sup> As part of a treatment plan for a patient, an inventory of the child's participation in sports and

recreational activities may be taken to establish a baseline for successful weight maintenance or loss.

**Exposure to Unhealthy Foods.** The unhealthy food environment to which children are exposed via junk foods, fast foods, and cafeteria foods encourages their consumption of these foods.<sup>48</sup> Children's eating habits tend to favor a higher intake of high-calorie foods, fat, saturated fat, sodium, and carbonated soft drinks, and a lower intake of vitamins, milk, fruits, and vegetables.<sup>49</sup> Many children are exposed to high-sugar snacks, foods, and soft drinks<sup>50</sup> that are associated with weight gain.<sup>43</sup> Dieticians may assist pediatricians and pediatric nurse practitioners in treating obesity by assessing a child's nutritional needs and the appropriateness of using restrictive diets.<sup>51</sup>

**A Family's Social Climate and Culture.** Family environments shape the development of food preferences, patterns of food intake, and eating styles that affect children's weight status.<sup>48,52-54</sup> Psychosocial factors, such as a family's social interactions, can also affect eating behavior and weight status. A poor family climate is characterized by conflicted, cold, and unsupportive or neglectful family dynamics.<sup>55</sup> Such dynamics can lead to fewer positive interactions at mealtimes in households with obese or overweight children than in households of normal-weight children.<sup>55,56</sup>

Family ethnicity and culture, too, can affect eating patterns.<sup>57,58</sup> Parents and other family members may transmit cultural messages and attitudes about weight, size, and shape.<sup>59,60</sup> This transmission is particularly the case in African American communities. Often adult family members act as role models, coping with stress by using food to moderate negative moods (ie, binge eating). African American girls and women are less exposed in the home to dieting as a means of maintaining a healthy weight, and they receive less negative social pressure from their families about being overweight.<sup>61</sup> Within the African American culture, greater acceptance exists for higher weight and larger body types.<sup>62,63</sup> Often, African American culture provides greater support for recurrent binge eating than is the case for Caucasian girls and women.<sup>64,65</sup> Latin culture also favors a more robust female body type,<sup>66</sup> with Hispanic girls and women preferring larger ideal body sizes and engaging more in binge eating than Caucasian girls and women.<sup>67,68</sup>

Psychologists and other mental health professionals with expertise in pediatric obesity and multicultural sensitivity training can assist physicians by addressing whether a family's culture, dynamics, or attitudes about food or body weight or size are contributing to the problem.<sup>69</sup>

**Media Exposure and Technologies.** The social environment has dramatically changed in recent years with the development of new recreational technologies (eg, iPhones and iPads) and social media platforms (eg, Facebook and Twitter) that encourage sedentary activity. Youth spend an average of more than 7 hours per day using media, and the vast majority of them have access

to a television in their bedrooms, a computer, the Internet, a video-game console, and a cell phone, all of which may aggravate pediatric obesity.<sup>70</sup> For example, increased television viewing is correlated with a risk of being overweight or obese in children and adolescents.<sup>36,38,71-75</sup>

Although some research suggests that sedentary behavior (eg, television viewing or game playing) displaces physical activity,<sup>76,77</sup> other research does not support a strong link between them.<sup>78</sup> Clearly, these inconsistencies in the literature suggest that a complex relationship exists between sedentary behaviors and physical inactivity,<sup>79</sup> both of which in early adolescence may impact BMI in late adolescence.<sup>80</sup> It is still unclear, however, how specific sedentary activities (eg, use of hand-held devices) might affect children's levels of physical activity and weight status with time. Greater daily media exposure (ie, screen time) may increase the potential not only for more sedentary activity but also for food consumption. Eating while viewing the television or movies is associated with greater overall food intake, notably through high-calorie foods (eg, soft drinks, fried foods, and snacks).<sup>81-84</sup> Satiety cues may be suppressed while watching television or movies,<sup>81</sup> the result being that children or adolescents consume larger amounts of food with little conscious awareness of having done so.<sup>85</sup> Prior to undertaking a treatment program for a patient, an inventory of the child's media exposure and use of technologies can be taken to develop a clinical picture of how these new recreational technologies and media-related pastimes might influence eating and patterns of physical activity.

## **Medical Complications and Comorbidities**

### **Physical Health**

Obesity in childhood presents significant physical health risks.<sup>86</sup> Being overweight or obese in adolescence is associated later in life with hypertension, high cholesterol, impaired glucose tolerance, and sleep apnea,<sup>37</sup> as well as with gallstones and some cancers.<sup>87</sup> Long-term medical complications of being overweight or obese during childhood are well documented, including arthritis,<sup>87</sup> cardiovascular disease, stroke, metabolic syndrome, and type 2 diabetes (1%-6% of overweight children<sup>88</sup>).<sup>37,89</sup> In particular, metabolic syndrome and type 2 diabetes are not only complications of being overweight or obese, but prominent features of the obesity epidemic. For example, some evidence supports a transgenerational cycle that increases the likelihood of obesity and diabetes in the offspring of the obese.<sup>90</sup> The evidence on metabolic syndrome and its associated risk factors in obese children argues that a full understanding of factors associated with obesity is crucial to developing the most effective interventions.<sup>91</sup> Obese children are at greater risk of becoming obese adults, with increased morbidity and mortality.<sup>92</sup>

## Mental Health

Obese children have lower self-esteem<sup>93-95</sup> and higher body dissatisfaction than normal-weight peers.<sup>96,97</sup> Obese children are vulnerable to weight-related teasing and social isolation<sup>98</sup> and tend to be ranked lower as potential friends by their peers.<sup>95</sup> Obese children and adolescents have significantly more psychopathology and behavior problems compared with normal-weight peers.<sup>98-100</sup> Obese adolescents seeking treatment for their obesity tend to have more depressive symptoms and lower self-esteem than nonobese control groups.<sup>101</sup> Obese children and adolescents also have increased risk of psychopathology in late adolescence and adulthood (eg, depression).<sup>102,103</sup>

In adolescents, obesity has been significantly related to depression, depressive symptoms, and shame.<sup>104</sup> For example, those adolescents who reported many experiences of shame had an increased risk for being depressed.<sup>104</sup> However, the relationship between depression and eating behavior is bidirectional,<sup>105</sup> making it difficult to discern clearly the causal relationship between obesity and depression, particularly in adolescents.<sup>106</sup> Depressed adolescents are at an increased risk for the development and persistence of obesity.<sup>107</sup> Depressive symptoms are associated with a higher BMI, intake of high-calorie foods, and sedentary behaviors.<sup>108</sup>

## Spiritual Health

An important but rarely studied aspect of children's health and well-being, spirituality is often conceptualized as encompassing existential beliefs, such as the search for meaning and purpose in life and transcendence.<sup>109-113</sup> Some researchers view spirituality as a transcendent relationship with what is considered sacred in life.<sup>114,115</sup> Spirituality has been linked to physical and mental health and well-being.<sup>109,112,116,117</sup>

Religiosity is generally conceptualized as reflecting beliefs in a god, frequency of prayer, and church attendance or membership.<sup>111,112</sup> A person can be described as or can describe herself or himself as being religious, implying adherence to beliefs, practices, and/or precepts of religion.<sup>112</sup> Religiosity has been associated with positive physical and mental health outcomes.<sup>117-119</sup> Spirituality and religiosity, however, are separate and distinct concepts,<sup>120</sup> and they may have differing impacts on eating behavior in general and on obesity in particular.

No studies to date have addressed the spiritual consequences of children being overweight or obese; however, findings from studies of spirituality and eating disorder symptomatology in adults are revealing. Women and men with higher BMIs tend to report lower spiritual well-being and more eating disorder symptomatology (ie, attitudes and behavior).<sup>121,122</sup> The finding that spirituality in women was more strongly related to that symptomatology than was religiosity<sup>122</sup> suggests the need to tease out further nuances between these constructs. Women with higher BMIs have been found to report

reduced feelings of hope, higher levels of body shame, and eating disorder symptomatology.<sup>123</sup> Overweight and obese children's lower levels of spirituality and hope also may be associated with heavier weights. Further study is needed to explore and establish these relationships definitively in children and adolescents.

## Interventions and Implications for Practice

Dietary interventions may facilitate weight maintenance or loss when combined with other strategies, such as increasing levels of physical activity and/or creating psychological interventions to promote behavioral changes.<sup>124</sup> Psychological interventions have been used in an effort to achieve long-term maintenance of behavioral change regarding weight maintenance and loss.<sup>124</sup> Treatments for childhood obesity can involve a combination of lifestyle changes, including strategies to reduce energy intake, increase physical activity, reduce sedentary activities, facilitate the family's involvement, and change behaviors associated with eating and physical activity.<sup>124</sup> Drug therapy in obese children should not be used as an isolated, solitary treatment but as a therapy complementary to the traditional treatments of better diets, increased physical activity, and supportive lifestyle changes.<sup>124</sup>

## Psychological Interventions

**Cognitive Behavioral Therapy.** Best practices and guidelines for the treatment of pediatric obesity include cognitive behavioral therapy (CBT), a well-studied psychological intervention with an emphasis on altering unhealthy cognitions, emotions, and/or behaviors.<sup>125,126</sup> CBT weight-management-and-loss programs include multiple behavioral and cognitive components, focusing on increasing levels of physical activity and reducing daily caloric intake. At times, CBT programs may benefit from including parents in the therapy, providing parents with skill training and enhancing a child and their family's readiness to make lifestyle changes.<sup>125-128</sup> Behavioral treatments can promote a child's increased physical activity, provide him or her with psychoeducation on making healthier food choices, set limits on the child's food consumption, and reinforce the support and involvement of children and their parents in group therapy.<sup>127,129</sup> Cognitive components may change thinking processes, addressing distorted or maladaptive thoughts and building problem-solving skills.<sup>127</sup>

Behavioral treatments may reduce overall food consumption and increase consumption of low-calorie foods (eg, fruits and vegetables) or decrease consumption of high-calorie foods (eg, junk or fast foods), thereby reducing body weight.<sup>127,129,130</sup> Children's choices of low-energy-dense foods over high-energy-dense foods depends on the availability and accessibility of these foods in the home and school. Behavioral treatments that include parents can ensure that they increase the availability of healthier foods. Family-based CBT weight



maintenance programs have been shown to have value for youth, particularly young children aged 5 to 12 years, in terms of choosing healthier foods and maintaining a healthy weight.<sup>130</sup> A study of behavioral treatments incorporating both diet counseling and increased daily physical activity showed as much weight loss as behavioral change strategies aimed at diet counseling only.<sup>131</sup> A follow-up study of behavioral treatments incorporating diet counseling plus behaviorally reinforced, structured exercise resulted in higher weight loss than those treatments focusing on diet counseling only.<sup>132</sup>

For example, in one study, a 13-week weight-reduction program focused on nutrition, physical activity, psychology, and parental participation yielded significant decreases in BMI and waist circumference for the intervention group at a 1-year follow-up when compared with those measurements for a control group.<sup>133</sup> In the intervention group, techniques aimed at changing behaviors related to dietary habits and levels of physical activity consistently showed favorable changes at both short- and long-term time points.<sup>133</sup> Another study comparing a 12-week versus a 24-week version of a family-based, pediatric, weight management program found a group-by-time statistical interaction, with only the 24-week group showing significant BMI reductions with time.<sup>134</sup> Taken together, overweight and obese children tend to benefit from family-based interventions for obesity management.<sup>135</sup>

As mentioned earlier, practitioners working with children may want to refer patients to psychologists or other licensed mental health professionals who can provide family-based, CBT weight-maintenance-and-loss programs.<sup>136,137</sup> Family therapy may also be needed to address a family's poor social climate, dysfunctional family dynamics, or a family's ethnic or cultural factors related to a child being overweight or obese.

**Animal-assisted Therapy.** Animal-assisted therapy (AAT) is a unique CBT tool showing promise in treating childhood obesity, particularly for children in urban environments who lack space for play. Dogs can alleviate a parent's fear about unsupervised play in unsafe urban neighborhoods. Because dogs can be protective and provide safety for the child, dog walking can be a tool to increase children's outdoor physical activity. Dog ownership among children and adolescents increases physical activity in terms of more minutes per day spent walking.<sup>138-141</sup> Dogs provide companionship, support, and motivation for walking<sup>142,143</sup> and can strengthen commitment to a weight loss program.<sup>144</sup> Dog play can encourage overweight and obese children to take part in play activities or sports that they might otherwise avoid due to physical limitations or fears of social rejection.

In addition to bolstering physical and mental health, dog walking can enhance spiritual health.<sup>145</sup> Dogs naturally have an abundance of life energy that can energize children and tap their spirituality and vitality. To date, the

spiritual benefits of dog ownership are unknown. Play with dogs may help give rise to an experience of intrinsic joy, creativity, and hopefulness, providing a sense of wholeness and connectedness to the universe. It may foster spiritual growth through connectedness with a child's physical body and its capabilities, with dogs as playmates that can elicit rudimentary social skills and interactions. When children play with dogs, they may run, dance, and mirror an animal's natural energy, enthusiasm, and exuberance for life. Clearly, more research is needed in this area.

### Medical Interventions

For some children, usually those who are younger and less overweight, weight loss is not a goal. Rather, the goal can be maintenance of their current weights or prevention of further weight gain so that they can grow into their weights.<sup>146</sup> Weight maintenance is the primary goal for children aged 2 to 7 years who have a BMI between the 85th and 95th percentiles and is an important goal even for those with a BMI higher than the 95th percentile.<sup>146</sup> It is advisable that weight loss is sought only after a steady baseline of weight maintenance has been attained.<sup>146</sup>

**Pharmacological or Surgical Interventions.** Weight management medications should be prescribed only for pediatric patients who have significant weight-related health risks and who have not reduced their weight successfully through structured dietary and exercise modifications.<sup>146</sup> Medications are best used as part of a comprehensive weight loss program that includes diet, physical activity, and behavioral treatments.<sup>146</sup>

Pharmacological and surgical interventions can be appropriate for severely obese children in the event that behavioral treatments such as family-based, CBT weight maintenance programs do not yield a significant decrease in BMI.<sup>147</sup> Very-low-calorie diets, high-protein diets, fasts, residential treatments, pharmacotherapies, and bariatric surgeries are often last-resort treatments, mostly for adolescents with morbid obesity.<sup>148,149</sup> Dietary changes and meal plans that reduce calories need to be employed cautiously and continuously monitored to ensure that an obese adolescent's nutritional balance is maintained and his or her healthy growth and development is ensured rather than jeopardized.<sup>150</sup> Further, research assessing dietary interventions for weight reduction in childhood and adolescence has found little evidence to support the use of low-fat, energy-restricted diets.<sup>151</sup> The relatively sparse data on pharmacotherapies have indicated moderate effects on body weight and obesity-related conditions<sup>152-153</sup> as well as potential adverse effects (eg, cardiovascular risk factors).<sup>152</sup> Intensive interventions such as bariatric surgery, which might result in significant weight loss for adolescents,<sup>154-156</sup> require careful consideration of risks, such as bowel obstruction, incisional hernias, peripheral neuropathy, beriberi, painful paresthesia, anemia, and death.<sup>157</sup>

**Educational Interventions.** A thorough medical history of the family can be taken and used as a baseline to introduce low-energy diets that balance macronutrients as well as greater physical activity.<sup>146</sup> Education for parents on providing appropriate nutrition, developing plans for monitoring the child's food and exercise, offering techniques of food preparation (cooking) to support dietary goals, and encouraging a child's self-management is a priority.<sup>146</sup> As noted earlier, the expertise of a dietician may be required for successful management of pediatric obesity.<sup>146</sup>

## Conclusions

The number of overweight and obese children is on the rise. A comprehensive understanding of biological and environmental factors and of the psychological aspects of pediatric obesity as well as of the interactions between these variables is vital if treatments and preventive efforts are to be effective. A need clearly exists for early interventions because serious physical and psychological health risks to children can result from this epidemic. The risks to spiritual health are still unknown and need further consideration. A multidisciplinary team composed of pediatricians, psychologists or other licensed mental health professionals, and dietitians can assist in the treatment of pediatric obesity. Obese children might benefit from the use of conventional psychological and medical interventions and adjuncts such as AAT, resulting in improved physical, psychological, and spiritual health. Future research will need to evaluate the effectiveness of these interventions for overweight and obese children and adolescents, separately and in combination, and in the short- and long-term.

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