A Systematic Review of Pediatric Obesity and Family Communication Through the Lens of Addiction Literature

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Abstract

Background: Both treatment of addiction and treatment of pediatric obesity often integrate the family unit. Thus, addiction therapies may provide a model to guide treatment of pediatric obesity, particularly issues of family communication, weight, and weight-related behaviors. The aim of this systematic review is to assess what knowledge in the field of addiction treatment can be translated to pediatric weight management, particularly in relation to family-based approaches and communication.

Methods: A systematic review of family communication and food addiction in obese children was conducted using MEDLINE and other databases, including all English-language studies published after 1990 meeting search criteria and related to family factors or family communication, and addiction treatment strategies used in obesity interventions.

Results: Three reviews, two survey studies, and two observational studies were included. Most focused on family communication; less-healthy communication patterns and parental restriction were related to maladaptive eating behaviors in children and attrition from weight management programs. A few studies suggested family communication interventions to improve unhealthy eating patterns in children, using therapies common in family treatment of addiction (*e.g.*, motivational interviewing and cognitive behavioral therapy). No studies presented concrete suggestions to aid family communication around issues of food and weight management. Potential contributions of addiction therapies are discussed.

Conclusions: Though the addictive properties of food have not been fully delineated and obesity is not classified as a disease of addiction, the field of addiction offers many approaches that may prove useful in the treatment of obesity.

Introduction

Current estimates are that 16.9% of US children are obese and 31.8% are either overweight or obese.¹ Despite numerous efforts to reduce obesity among children, results have been modest² and the prevalence of childhood obesity has remained constant over the past few years.¹ Looking to other areas of behavioral healthcare may provide guidance for improving this trend. For example, motivational interviewing,³ originally developed for use in alcohol abuse therapies, has shown promise for, and is now a commonly used approach, in treating obesity among adolescents.^{4,5}

Causes and contributors to obesity are varied and diverse,⁶ and approaches to treatment must be tailored to the needs of the individual. Researchers have begun to explore the possible addictive properties of hyperpalatable foods in

the US food environment.⁷ These foods, which have increasingly high levels of sugar, fat, and other additives, may trigger addictive processes as they activate the reward circuitry within the brain.⁷ Neural pathways of reward circuitry are activated by certain foods, leading to excessive dopamine release and opioid stimulation⁸ similar to those activated by various drugs.⁹ As a result of commonalities between the effects of food and drugs on the brain, Volkow and Wise⁹ suggested that behavioral interventions used in addiction treatment could have value for the treatment of obesity. They noted that both drug addiction and obesity involve ingestion habits that continue despite negative consequences and both involve powerful reinforcers that drive continued ingestion and neurobiological adaptations.

Recent research has further explored the potential for foods to trigger addictive processes, providing some

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evidence that children may develop addictions to certain foods. Studies utilizing the Yale Food Addiction Scale (YFAS)¹⁰ support the notion of food addiction in adults.¹¹ Merlo and colleagues were among the first to investigate symptoms of food addiction in children and provided preliminary support for food addiction in this population.¹² This study adapted the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV)¹³ criteria for substance abuse and dependence to children between 8 and 19 years of age and measured attitudes toward eating and food.¹² Levels of obesity were related to food attitudes and weight management, and some children experienced a drive to eat comparable to that of an addiction. Preliminary studies have begun to further explore this concept of food addiction within samples of children. The YFAS for Children (YFAS-C) has recently been validated in children.¹⁴ The scale may be useful in exploring problematic eating behaviors in children that resemble those of addiction.

Though the DSM-V has been recently released, research in the area of food addiction has utilized criteria from the DSM-IV text revision (DSM-IV-TR) for substance dependence.¹³ A second seminal article on the topic examined each criterion for substance abuse and dependence outlined by the DSM-IV-TR in relation to food addiction.¹⁵ For a diagnosis of substance dependence, three of the seven criteria in the DSM-IV-TR should be met (Table 1),¹³ in addition to experiencing clinically significant impairment or distress resulting from substance use. Gearhardt and colleagues compared food addiction research to the diagnostic criteria for dependence and found support for loss of control over consumption, repeated failed attempts to reduce intake, and continued consumption despite negative consequences.¹⁵ At present, there is insufficient evidence to

determine whether the remaining criteria (tolerance, withdrawal, giving up other activities in favor of the substance, and spending a large amount of time acquiring and recovering from the substance) exist for food addiction. Clinically significant impairment or distress as a result of food addiction, a necessary component for the diagnosis of substance dependence, may also be apparent.

Treatment of pediatric obesity is most often in the context of the family.¹⁶ Similarly, addiction treatment will often involve family members.^{17,18} In traditional treatment paradigms, addiction is often seen as a family disease. The Big Book of Alcoholics Anonymous (BBAA) states that, “the whole family is, to some extent, ill.”¹⁹ The concept of addiction as a family disease implies that all individuals within a family unit must be involved in treatment of the addiction. A study by McGillicuddy and colleagues, which focused on adolescent substance use, found that poor parent-adolescent communication was associated with adolescent substance use.²⁰ A coping skills training intervention with a focus on communication led to improved family communication and was related to subsequent decrease in adolescent substance use.²⁰ Although the context of alcohol and drug addiction treatments are different, this support for family inclusion and positive communication is similar to the American Academy of Pediatrics’ stance on family-based treatment as the gold standard for treatment of pediatric obesity.²¹ Family-based approaches have shown short- and long-term improvements in a child’s weight status.^{21,22} Unfortunately, high rates of attrition limit the effect of these interventions.²³ Therefore, utilizing behavioral interventions within family-based approaches may hold promise to improve health outcomes, lower attrition, and broaden applications, particularly in complex areas such as family communication and relationships.

The aim of this systematic review of the literature is to assess what knowledge in addiction treatment can be translated to pediatric weight management, particularly in relation to family-based approaches and communication. This review will describe the evidence base for family communication surrounding pediatric obesity and issues of food and weight management. The overall goals are to identify gaps in research with potential to improve treatment outcomes, as well as to glean potential approaches to inform clinical care and research by determining what characterizes positive family communication in addiction therapy. Such research would have implications for improving treatment of pediatric obesity in the setting of family-focused treatment, in particular, the nascent field of food addiction.

Methods

Data Sources and Search Strategy

A systematic review of family communication and food addiction in obese children was conducted using PsycINFO, PubMed (MEDLINE), and CINAHL (Cumulative Index to Nursing and Allied Health Literature). Search terms included obesity, overweight, and addiction, which were

Table 1. DSM-IV-TR Criteria for Substance Dependence^a

I. Tolerance, defined by either markedly increased amounts to achieve desired effect or markedly diminished effect with continued use
II. Withdrawal, manifested by characteristic withdrawal syndrome or need to take substance to relieve or avoid withdrawal symptoms
III. Substance taken in larger amount or for longer period than was intended
IV. Persistent desire of repeated unsuccessful efforts to quit or cut down
V. Much time spent obtaining, using, or recovering from substance
VI. Important social, occupational, or recreational activities given up because of substance use
VII. Continued use despite knowledge of adverse physical or physiological consequences

^aAmerican Psychiatric Association *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision (DSM-IV-TR).¹³

cross-searched with the terms children, family, parent, communication, and family function. English-language studies published after 1990 were considered, including peer-reviewed studies, reviews, trials, commentaries, and interventions. Relevant studies referenced in selected studies were also reviewed. Binge eating disorder was not included in this review because a recent systematic review by Hay thoroughly describes the evidence-based application of cognitive behavioral therapy (CBT) for the treatment of this condition,²⁴ and the link between binge eating and addiction is not clear at this time.

Study Selection and Data Extraction

Article titles and abstracts, yielded by searches, were screened and full articles were obtained if the article appeared to meet criteria for inclusion. Inclusion criteria included articles related to (1) family factors, family communication, or parent-children interactions in relation to food and eating behaviors and (2) classic addiction strategies applied to obesity treatment. Articles were excluded if they (1) were related only to obesity treatment or addiction treatment, (2) had no reference to family, or (3) focused on other conditions, such as attention-deficit hyperactivity disorder or schizophrenia. Full texts were reviewed to determine potential inclusion in analysis. Studies were reviewed to determine whether they addressed the concepts of addictions therapy and obesity treatment, highlighted relevant treatments or concepts that could be applied to pediatric weight management, or pertained to family-based treatment approaches and communication. Data including study design, objectives, overall findings, and conclusions were extracted from the identified articles.

Results

The literature search utilizing the defined keywords yielded 276 abstracts. Of these, 168 were duplicates, yielding 108 abstracts; these were reviewed to determine if they met inclusion criteria. Applying the inclusion criteria above, 99 abstracts were found to not include a focus on addiction and obesity. Nearly all excluded studies had a singular focus on addiction or obesity treatment or on family-based treatment of various physical or mental health conditions, such as schizophrenia. A total of nine full-text articles met inclusion criteria and were reviewed for additional references. Two studies did not meet inclusion criteria: One dealt with binge eating disorder and another on events in which eating was part of a celebration (Fig. 1). Seven articles were retained for final inclusion. Three reviews, two survey studies, and two observational studies were reviewed, all of which were published after 2003 (see Table 2).^{4,25–30}

The extant literature about family communication, pediatric obesity, and addiction focused largely on how parental behaviors, parenting styles, and family communication may contribute to maladaptive eating behaviors in children. Four articles focused on family characteristics related to adverse eating behaviors, where parental control and food restriction

were related to overeating behaviors in children.^{25–27,30} In addition, the study by Czaja and colleagues found that families of children with loss-of-control eating were characterized by less-healthy communication patterns and interpersonal involvement.²⁶ A review by Carlisle and colleagues found that authoritarian parenting styles, characterized by low sensitivity and low emotional support, were related to increased risk of obesity in children as a result of problematic eating patterns.²⁵ In a large observational study by Rodenburg and colleagues, parenting style moderated the relationship between child appetitive traits and weight, which, in turn, influenced children's behavioral susceptibility to obesity.³⁰ Authoritative parenting style, characterized by high parental support and high control, reduced the negative effect that food fussiness had on child fruit consumption. A nationwide survey of Italian adolescents 15–19 years of age investigated the relationship between food addiction, use of other substances, and family variables²⁷; similar environments were related to the abuse of food and other substances. Therefore, family variables, such as parental monitoring and poorer family functioning, contributed to an environment in which adolescents were more likely to be overweight and engage in substance use.

Whereas most articles reviewed described family characteristics related to maladaptive eating behaviors in children, one article focused on how family characteristics affect treatment of pediatric obesity. This study by Acosta and colleagues found that higher family conflict and more dysfunctional family communication were related to decreased retention in treatment, whereas higher levels of family support were related with successful child weight loss.⁴

Three articles suggested the use of therapies common in family treatment of addiction to counsel families affected by pediatric obesity.^{4,25,28} These suggestions are largely based on the parallels in neural pathways that exist between obesity and addictive behaviors.⁴ Such parallels provide evidence to support development of new pediatric obesity treatments by employing addiction therapies. Similarly, another study called for parent-child communication training as an intervention for maladaptive eating patterns.²⁶ Advocating for a broader application of addiction classifications beyond drugs and alcohol, Hagedorn outlines subtypes of addictions to include those of eating and food.²⁹

According to Carlisle and colleagues, parents of families affected by pediatric obesity or with children who display problematic eating behaviors may be hesitant to make changes as a family, because they may not fully recognize or accept that their child has a problem requiring treatment.²⁵ Two articles suggested motivational interviewing as a tool in family-based treatment of pediatric obesity to assess such hesitancy and leverage readiness for change.^{25,28} This strategy targets ambivalence for change common in individuals undergoing treatment for addiction or weight management and among their families.²⁸ Another review suggested that obese children and their families could benefit from CBT to identify and manage

Figure 1. Systematic review flow chart.

triggers of unhealthy behaviors.⁴ However, despite some general suggestions for the use of addiction treatments to aid families within pediatric obesity treatment, no studies made concrete suggestions to guide family communication around issues of food and weight management.

Discussion

Although there has been some movement toward utilizing addiction therapies to improve pediatric weight management treatment, particularly a focus on family communication, few concrete suggestions have emerged

regarding how families can best communicate with children about weight management. Very few articles met our search criteria, and those that did only described general approaches for pediatric obesity treatment by using addiction therapies to target family communication. There appear to be overlapping concepts within the fields, yet little evidence of family-based addiction therapies being translated into obesity practice, because all studies identified were published within the last 10 years.

Suggestions for family counseling in relation to addiction behaviors included the utilization of motivational interviewing, CBT, and solution-focused brief therapy

Table 2. Studies of Pediatric Obesity, Family Communication, and Addiction

Author	Year published	Study design and objective	Study population	Findings
Acosta, MC ⁴	2008	Review of parallels between obesity and addictive behaviors; suggest treatment recommendations employing addiction therapies based on the parallels	—	Obesity and addiction are both ingestion habits that are reinforced by the ingested substance. They share patterns of transmission, including genetic predisposition, environmental risk factors, and common neurobiological pathways. Drawing on these parallels suggests that employing motivational strategies to engage children and families in treatment may be helpful, and cognitive behavioral therapy techniques can be used to identify triggers underlying bad eating habits.
Carlisle, KL ²⁵	2012	Review of family factors that have a primary influence on food addiction symptoms of children and strategies for intervention	—	Family variables that influence child eating patterns include dysfunctional family interactions, parental modeling of adverse eating patterns, and parental control over child eating. Counseling techniques including motivational interviewing and solution-focused brief therapy for family members of children with food addiction may reduce food addiction among children.
Czaja, J ²⁶	2011	Observational study; examine parent-child interactions and children's eating behavior during a mealtime in families of a child with and without loss-of-control (LOC) eating to evaluate the influence of family functioning on child LOC eating	n = 74 Mean child age = 10.58 (range, 8–13) 58% children with LOC eating	Families of children with LOC eating were characterized by more maladaptive overall family functioning and decreased interpersonal involvement. Testing parent-child communication training as an intervention for LOC eating in children was suggested.
Denoth, F ²⁷	2011	Cross-sectional nationwide survey study; examine BMI, eating attitudes, self-esteem, and use of substances in adolescents and explore the relationship of these factors with family factors	n = 33,815 Age range: 15–19 years 50% female 1.8% BMI ≥ 30	Overweight adolescents consumed more drugs, except for cannabis, and more tranquilizers and sedatives, without a medical prescription. Once accounting for psychosocial factors, this relationship no longer exists. Therefore, the psychosocial environment that contributes to being overweight and substance use may be similar and therefore lead to the correlation between these variables. Adolescents who were overweight and using substances tended to have serious problems with parents and lacked family structure or parental support. Targeting modifiable family variables is suggested for intervention or prevention of both overweight and substance use.
DiLillo, V ²⁸	2003	Review of motivational interviewing; discuss the use of motivational interviewing in behavioral obesity treatment	—	Motivational interviewing has been effective in treating addictive disorders by increasing adherence to treatment and may also prove to be helpful in weight loss. Ambivalence that exists in weight loss patients is similar to that in addiction treatment. Using motivational interviewing in individual sessions coupled with a comprehensive weight loss program is suggested.

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Table 2. Studies of Pediatric Obesity, Family Communication, and Addiction continued

Author	Year published	Study design and objective	Study population	Findings
Hagedorn, WB ²⁹	2009	Position paper and cross-sectional survey study; present arguments for and against an official diagnosis of addictive disorder for process addictions and determine if a new diagnosis is warranted by surveying opinions of professionals	n = 17; convenience sample of professionals at a poster session on addictive disorders Age range: 30–69 years 65% female 88% Caucasian 35% clinicians; 47% educators; 18% graduate students	A total of 91% of participants endorsed the addition of a diagnosis of addictive disorder for process addictions. Common themes in responses to benefits of such a diagnosis included training, education, research benefits, client benefits, and clinical benefits. A total of 47% stated there were no deterrents to the addition of this diagnosis and those who stated deterrents included overlap with established disorders, pathologizing client behaviors, and complications related to insurance. Recognized that family members living with process addictions have a right to effective mental health treatment resulting from relationship difficulties, codependency, and other hardships resulting from the behaviors of their addicted family member
Rodenburg, G ³⁰	2012	Observational study; examine the influence of parenting style on the association between children's appetitive traits and dietary behaviors and weight in a large, community-based sample of children	n = 1839 Mean age = 8.2 (range, 7–10); 50.5% boys 7% underweight; 79% normal weight; 14% overweight; 3% obese	A positive, graded association existed between food-approaching characteristics and weight and a negative, graded association existed between food-avoidant characteristics and weight. Parenting style moderated these associations such that authoritative parenting reduced the negative effect of food fussiness on fruit consumption and neglecting parenting strengthened the positive relation between food-approaching appetitive traits and weight. Therefore non-neglecting and authoritative parenting styles seem to be protective of child BMI and dietary intake. Targeting parents for preventive interventions on child weight and dietary intake is suggested.

focusing on constant change.²⁵ Such therapies, which are also employed in family addiction treatment programs, suggest a need for change within all members of the family, not just an individual with the diagnosed addiction. This approach highlights the use of family treatment as a component of an addict's treatment and mirrors the basis of the family-based approach of pediatric obesity treatment. One survey called for an official diagnosis of process addictions, including food addiction, because such a diagnosis would be necessary for family members to receive appropriate treatment for themselves and the family member affected by obesity.²⁹

Communication in families affected by addiction may be salient in the treatment of pediatric obesity. Miller and colleagues extended the concept of addiction treatment to obesity treatment encompassing a family model, stating that "treatment of obesity, like treatment of addiction, requires changes in daily life and expectations for the entire family."³¹ The disease of addiction within a family results in the development of ineffective communication roles, necessitating interventions in family communication. Though there is discussion in the literature regarding the extension of addiction therapies to pediatric obesity, from this systematic review, it does not appear that this translation of treatment is occurring.

The BBAA focuses on the importance of family communication in addiction therapy by highlighting open discussions where families reflect upon the past and the family member's addiction as a tool for moving forward.¹⁹ In this process, it is also important that family members show patience, tolerance, and love toward the family member experiencing addiction, avoid ordering them how to change their behavior, and avoid self-blame.¹⁹ Family members should attempt to prevent their loved one's addictions from affecting their own relationships, both within and outside the household. They should be honest about how the disease affects their family and seek others who understand their situation. Therefore, the BBAA places family communication and inclusion of family-based treatment at the core of its approach and such a method may provide guidance to those involved in the family-based treatment of pediatric obesity. The guidance provided by the BBAA may be applicable to family members supporting a child who is attempting to lose weight in a pediatric obesity program. Consequently, it may be possible to draw clinically relevant treatment strategies from this field.

Although the level of conflict and tension within families affected by addiction may not completely parallel that of a family affected by pediatric obesity, a similar sense of frustration is apparent. Parents of children with disordered and unhealthy eating behaviors likely experience frustration as they try to teach the health risks and dangers of those behaviors, particularly if children make no attempts to curb behavior and parents cannot understand their children's own experiences. Families affected by pediatric obesity, then, might benefit from family-based treatment

methods employed in addiction therapies, as shown in the use of motivational interviewing.^{5,32} As with addictions, obesity tends to "run in families" with multiple family members affected,³³ and family-based approaches hold promise to improve the health and well-being of more than an affected child.

Treatment of pediatric obesity has changed slowly from child-only weight loss interventions to family-focused lifestyle modification.³⁴ Parent-only interventions have proven as successful as those including children,³⁵ and there is increasing interest in parenting skills to support healthy lifestyle changes.³⁶ Traditional behavior modification approaches, such as stimulus control, self-monitoring, and goal setting, are also used in a family setting.³⁷ Broader family-based approaches, including family therapy, are being considered as family systems theory and other approaches are incorporated into interventions.^{34,38} As researchers and clinicians work toward concretely defining family-based treatment of pediatric obesity, it is important to look more closely at the family unit and the relationships of individuals involved in treatment. The circumplex model of family functioning,³⁹ which states that communication facilitates balance within the family unit, highlights the importance of exploring family communication within a family-based treatment structure.³⁸ Although not extensively studied in obesity,³⁸ communication within a family participating in a family-based obesity treatment program is likely to be of great importance and may provide further insight into treatment processes. Teasing and bullying are well-recognized problems and may result as much from family members as from peers.^{40,41} If teasing occurs during healthful activities, such as sports and exercise, it may negatively influence the child's attitudes toward these activities.⁴⁰ Providing guidance to families in how best to communicate around health behaviors, and instruction in preferred language regarding weight,⁴² is likely to improve the child's experience in weight management and may improve outcomes.

Attrition from obesity treatment programs is high²³; better approaches to engaging families and supporting them through a change process is needed for obesity programs to be more successful. Such programs have been developed for the treatment of addiction, guiding families through communication exercises in order to reopen the lines of communication.²⁰ These programs begin by teaching family members of an addicted individual about the disease in order to remove stigma and blame and then encourage the start of communication in a very structured manner. Statements that focus on an individual's feelings are encouraged during these exercises. Within pediatric obesity programs, preparing families to participate in treatment, and how to best support the child with a weight issue, can potentially improve outcomes, particularly attrition.⁴³ Clearly identifying parental roles in treatment, apart from being providers, role models, and authority figures, can facilitate effective communication with the family.

Current expert recommendations for the treatment of pediatric obesity encourage inclusion of parents and family members in treatment processes, with a focus on eating habits of the entire family.⁴⁴ Treatments with parent-only designs have also demonstrated success in changing the home environment and supporting lifestyle modifications at the family level.^{45,46} Increased focus on the family and incorporating theories of family process and function³⁸ may improve the effectiveness of pediatric obesity treatments, in addition to using approaches proven in family-based therapies of addiction. It is important to note that not all obese children experience an addiction-like condition; with the preliminary validation of the YFAS-C,¹⁴ such a scale will assist researchers in exploring whether addictive behaviors affect a child's weight status and potentially help clinicians to determine which of their obese pediatric patients may benefit from addiction-focused treatment. At this point, it is unclear whether there would be any potential disadvantages of using addiction as a guide for treatment of pediatric obesity. Both obesity and addiction are conditions that carry a social stigma; whereas this similarity suggests the utility of the framework of addiction for obesity treatment, it may also carry the risk of added stigmatization. Further, there is the potential to use food addiction as an "excuse," deflecting one's attention away from behavior change and education as potential measures to improve weight status. Finally, there is much that remains unknown about food addiction and its contribution to obesity.

It is also important to recognize that though there seems to be some evidence to suggest the possible addictive properties of foods,^{7,9,10,12,14,15} drug addiction treatment and food addiction treatment will always have significant differences. Abstinence is the central focus of many addiction treatments, but such an approach would obviously not be possible in the treatment of pediatric obesity because children must consume appropriate nutrition to grow and survive. Therefore, other modalities must be employed, such as avoidance of food stimuli and exposure to advertising. Also, because parents have a great degree of control over the food environment of children,^{47,48} which exceeds that of an environment of addiction, parents must be equipped to support their children's healthy eating habits, prevent over-restriction, and navigate the food environment outside of the home. In family-based addiction treatment, parents are often equipped to provide proper support to the child with addictions; for parents of obese children, they must be equipped to facilitate change within the home and support their child's attempts at behavior change.³⁶ Though conceptually these are similar, in practice they may be quite different.

The extant literature described many family characteristics that contribute to unhealthy eating behaviors in children and decreased success in pediatric weight management treatment,^{23,49–54} including parental control, food restriction, and unhealthy family communication. However, which characteristics predict successful treatment of

pediatric obesity remains undefined, beyond the need for family support and good family communication.^{55–57} The literature on treatment of addiction provides concrete guidance on how families can best discuss the issues of their loved one's disease to aid in the repair of the family unit, which is necessary for successful addiction management. Such concrete advice is lacking in the literature for the family-based treatment of pediatric obesity and must be further explored.

Conclusion

The literature on addictive properties of food suggests that use of addiction treatment techniques could aid the treatment of obesity.^{7,9,10,12,14,15} Similar to the treatment of addiction, pediatric obesity treatment focuses on family-based treatment, yet few studies have examined the potential of addiction interventions used in families to guide family communication surrounding issues of pediatric obesity. Given the potential of family characteristics and conflict to influence children's maladaptive eating behaviors and attrition from weight management programs, family addiction therapies may provide useful to guide future recommendations for family-based pediatric obesity treatment programs. Concrete advice is lacking in the literature for family-based treatment of pediatric obesity, which merits further exploration.

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