

**Feeding Disorders of Infants and Toddlers:
A Follow-up to the Treatment of Infantile Anorexia**

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Addendum

To protect the privacy of the subjects involved in the study, no personal content or hard data will be released. Additionally, too few subjects have participated in the current follow-up study and therefore no statistical conclusions can be made and no data will yet be released.

Appendices A-D, the Results section, as well as portions of the Discussion have been removed due to their personal content and for the protection of individuals. Sections marked with asterisks (***) indicate that textual content has been removed.

Abstract

Feeding disorders of infants and toddlers have become more prevalent as diagnostic criteria and assessment are specialized, yet few longitudinal studies have been conducted to investigate the effectiveness of treatment. Infantile Anorexia (IA) is a specific feeding disorder that often emerges between 6 months and 3 years of age, characterized by the child's refusal to eat adequate amounts of food, an inability to regulate hunger and fullness, distractibility and a greater interest in the environment than eating, and significant growth deficiency. Between 2000 and 2005, a treatment study for children diagnosed with IA focused on the internal regulation of eating according to hunger and fullness. The goals of the study consisted of helping parents understand their child, implement feeding guidelines to set up regular mealtimes, and address limit-setting for the child's oppositional behaviors during mealtime. Currently, a follow-up study is being conducted to examine the long-term effect of the treatment of IA, investigating the children's eating behavior, anxiety and externalizing behavior, cognitive development, and the parents' stress and psychopathology. This research examines the assessment and treatment of Infantile Anorexia, and the current follow-up study that will provide crucial insight to the effectiveness of treatment and the development of these children.

Introduction

Feeding disorders in children have become more prevalent as diagnostic criteria and assessment are specialized. Diagnostic criteria for Feeding Disorders of Infancy or Early Childhood was added to DSM-IV and proved to be a significant step forward in diagnosing this disorder in children. In DSM-IV the American Psychiatric Association (APA, 2010) characterizes the disorder as a feeding disturbance with onset before 6 years of age, marked by failure to eat adequately with failure to gain weight or significant weight loss for at least one month. Diagnostic criteria also state that the disorder is not due to a medical condition and cannot be accounted for by another mental disorder. There has been growing awareness of the significance of feeding disorders in infants and toddlers, and research in this area has been expanding.

Feeding disorders can be described as oral stage issues that may be based on sensory or motor development (Kleinman, 2009). Feeding disorders affect up to 25% of normally developing infants and up to 35% of infants with developmental handicaps (Benoit, 2000). Some symptoms indicating a feeding disorder relate directly to feeding skills and the infant's behavior during feeding, such as "partial to total food refusal, quick loss of interest, oral motor, oral sensory and oropharyngeal difficulties, vomiting, inability to graduate to textured foods, gagging, coughing, ingestion of nonnutritive substances [pica], and tantrums" (Benoit, 2000, p. 340). Other common difficulties in feeding include "'eating too little,' restricted food preferences, delays in self-feeding, objectionable mealtime behaviors, and bizarre food habits" (Chatoor, 2002, p. 163). These feeding problems can become severe, with insufficient weight gain caused by refusal to eat and vomiting. These severe feeding problems occur in 1% to 2% of infants younger than one year of age, and 70% of these infants continue to have feeding

problems 4 to 6 years later (Chatoor, 2002). Feeding disorders of infancy and early childhood significantly influence the child's cognitive development, behavior, and of course physical development.

The consequences of inadequate food intake are evident in the child's growth. The child does not gain sufficient weight, and their height growth also slows down as chronic malnutrition develops. The child's head circumference may continue to grow, so the child may appear proportionate in the body, but the head appears too large. However, before puberty the children do have a chance to catch up in growth if they begin to eat better (Chatoor, 2002). Insufficient caloric intake associated with feeding problems can also affect cognitive development. Chatoor et al. (2004) conducted a study investigating a specific feeding disorder she labels Infantile Anorexia and cognitive development, and found that children in the healthy eater group displayed significantly higher scores on the Mental Development Index than children with Infantile Anorexia. However the results also showed that psychosocial factors such as SES, maternal education, and interactional conflict were stronger predictors of the Mental Development Index score than nutritional status.

Certain risk factors for the development of feeding disorders have been identified. Feeding problems do not discriminate by socio-economic status. Feeding disorders have shown to occur in all socio-economic groups (Wright, 2005). But family stressors can diminish a parent's capacity to support their child and respond to them appropriately. Some of these stressors include racism, a lack of support following relationship disintegration, and poverty (Batchelor, 2008). Additionally, studies show that children are more likely to experience early feeding problems if they have a difficult or fussy temperament in infancy (Ammaniti et al., 2009).

The various manifestations of feeding problems present similar nutritional deficiencies in children and can lead to very serious consequences. With growing awareness of feeding disorders in infants and toddlers and the significant effect feeding problems have on physical growth, cognitive and behavioral development, it is crucial that researchers, clinicians, and parents have a comprehensive understanding of the child's disorder. Currently, a revised DSM-V is being developed, in which a proposal has been made to rename Feeding Disorder of Infancy or Early Childhood to Avoidant/ Restrictive Food Intake Disorder (APA, 2010). Additionally, the proposal involves three subtypes to be included in the diagnostic criteria: children who do not eat enough or show little interest in feeding, children who limit feeding due to sensory aversions, and children who refuse food in response to an aversive or traumatic experience. The inclusion of these specified diagnostic criteria would prove to be significant progress in the field and would lead to further research that is critical to the diagnosis and treatment of these children. Longitudinal studies will be the key to understanding which treatments are effective, and how children suffering from feeding disorders continue to develop throughout life.

Diagnostic Criteria and Treatment of Infantile Anorexia

Chatoor (2002) has described specific and differentiating definitions by separating criteria for what she has labeled as six separate feeding disorders. Chatoor's diagnostic criteria address both organic and non-organic causal factors, providing reason and explanation for a variety of symptoms and feeding problems. One of the six disorders has received extensive focus in research and is labeled as Infantile Anorexia.

Infantile Anorexia emerges between 6 months and 3 years of age. The child begins to transition into independent feeding and eating, and a new dynamic emerges between the child and caregiver. In the transition between spoon and self-feeding emerges the negotiation of who

will place the food or spoon in the child's mouth. During this age, the child also begins to learn and understand the idea of hunger and fullness. Chatoor (2002) writes that emotional experiences and needs also play a role, and sometimes if the caregiver does not understand the emotional needs of the child, he or she may offer food. The infant then confuses hunger with emotional experiences and learns to eat or refuse to eat in response to feelings of boredom, loneliness, frustration, or anger. It is important to note that this disorder is different from feeding disorder of reciprocity in that it is not characterized by maternal deprivation or neglect.

The diagnosis of Infantile Anorexia would correspond to the proposed subtype in DSM-V describing children who do not eat enough or show little interest in feeding. Children with Infantile Anorexia may take a few bites of food, and refuse to eat any more. The child may be incredibly distracted, trying to climb out of the chair, throwing utensils, or looking around the room rather than eating. The child does not show interest in eating, but shows great interest in exploration, play, and interaction with caregivers (Chatoor et al., 2004). Parents claim that the child does not even seem to show signs of hunger. In response to the infant's inadequate food intake, parents use techniques of coaxing, distracting, offering different foods, feeding while playing, feeding at various times of the day, threatening, and force feeding (Chatoor, 2002). These strategies however will produce negative consequences where the child's eating is then completely regulated externally by the parents.

Chatoor (2002) describes the diagnostic criteria for Infantile Anorexia as follows:

- Child refuses to eat adequate amounts of food for at least one month.
- Onset of food refusal often occurs during the transition to spoon and self-feeding, typically between 6 months and 3 years of age.
- Child does not communicate hunger and lacks interest in food but shows strong interest in exploration and interaction across caregiver contacts.
- Child shows significant growth deficiency.
- The food refusal did not follow a traumatic event.
- The food refusal is not caused by an underlying medical illness. (p. 172)

Chatoor has developed a transactional model for Infantile Anorexia. These children have a poor hunger drive and refuse to eat, thus eliciting anxiety in their parents, specifically the mother. The parents often try to compensate by distracting the child with toys or television during feeding, and even force-feeding the child. These behaviors create even greater conflict between the parent and child and feeding time becomes a power struggle. The child may even result to screaming, crying, or physical attempts to hold the caregiver's attention. The child associates feeding with these negative interactions and the struggle to control the parent-child relationship. Eating no longer focuses on the regulation of hunger, but focuses on the interaction between parents and child.

Maternal/Caregiver influence and infant-mother relationship.

As previously noted, the role of the caregiver and the relationship between caregiver and child hold a significant affect on feeding. Chatoor and colleagues (2004) found that in children with Infantile Anorexia, when mothers and toddlers were in conflict over refusal to eat, and when the mother struggled to force the toddler to eat, there was a negative effect on cognitive performance. The interaction and behavior of mother and child not only affects the toddler's eating, but also leads to further difficulties in poor cognitive performance. Similar negative effects were also seen when mothers interacted intrusively during play. When the mother directed play rather than taking the child's cue, the toddler again showed poor cognitive performance. It is evident that the parent-child relationship in children with feeding disorders will not only affect the regulation of eating but can also contribute to poor cognitive performance.

The mother-infant interactional patterns are significant in Infantile Anorexia. Toddlers with Infantile Anorexia show less dyadic reciprocity, less maternal contingency, greater conflict,

and more struggle for control (Chatoor, 2002). Many studies have investigated the effects of maternal psychopathology on a child's socio-emotional development, with findings showing evidence for the increased risk of child disturbance. Ammaniti and colleagues (2009) investigated the influence of maternal psychopathology on feeding disorders, specifically Infantile Anorexia. Depressed mothers provide less positive engagement with their infants during feeding interaction, appear to be sad and even anxious during interactions, and have difficulty in recognizing and empathizing with the child's emotional states during mealtime (Ammaniti et al. 2009). Mothers with eating disorders can also negatively influence their child's eating. These mothers are preoccupied with their own body weight, shape, and food, and this preoccupation affects feeding interactions with the child (Ammaniti et al., 2009). In the results of the study, Ammaniti et al. (2009) found varying effects of maternal psychopathology and child variables on interactional conflict during feeding, depending on the age of the child. Bulimia, food preoccupation, and oral control were the only maternal predictors of mother-child interactional conflict during feeding for young infants. For toddlers, maternal depression had a significant influence, and in older children, maternal psychoticism was also a predictor for the interactional conflict. Maternal bulimia and food preoccupation were significant predictors at all ages. The study also found that child variables also played a role in mother-child interactional conflict during feeding. Temperamental characteristics were weak predictors for conflict in infants, but became stronger predictors in toddlers. In older children, anxiety/depression and withdrawal acted as predictors for interactional conflict. The study upholds that various child characteristics interact with the psychological vulnerability of the mother, which then hinders the mother in empathetic recognition of her child's feelings of hunger and fullness. This interaction

perpetuates so that the child does not develop an internal regulation of feeding and associates feeding with negative emotions (Ammaniti et al., 2009).

A study by Ruth Feldman and colleagues (2004) investigated the effects of mother-child touch in infant feeding disorders. Feldman et al. (2004) note that Chatoor (2000) coined the term “feeding relationship” to emphasize the dyadic nature and importance of the infant-mother relationship during the feeding process. Many studies have looked into the effects of mother-infant interactions in feeding disorders in comparison to healthy control groups, but this makes it difficult to note specific relational patterns that have a negative or positive effect. Feldman et al. (2004) looked for specific indicators of difficulties in the mother-infant relationship with children suffering from feeding disorders. The study observed indicators in the mother, child, and environment, with maternal depression and relational patterns as maternal factors, difficult temperament and social behavior as child factors, and home environment and social support network as environmental factors. Comparisons of three groups of children were included: children with feeding disorders, children with non-feeding Axis 1 disorders, and control. The mother and child were observed during play, where researchers analyzed mother and child touch patterns, response to touch, and proximity during play. Sensitivity and intrusiveness of the mother, child involvement and withdrawal, and reciprocity were analyzed during feeding. Results of the study showed that for children with feeding disorders, mother and child showed less overall touch, were not receptive to touch, and more often were in an out-of-reach proximity from each other. During feeding, there was high maternal intrusiveness and forceful touch and child withdrawal. The home environment was not optimal and mothers reported low levels of self-efficacy. Affectionate touch, proprioceptive touch, which supports physical growth (Field, 1995, cited by Feldman et al., 2004), and unintentional touch were all reduced for children with

feeding disorders. These results suggest that there is a relationship between children with feeding disorders and to what extent the child is suffering from touch deprivation. The mother-infant relationship is significant, and touch and proximity are a crucial part to that relationship. Evidence suggests that reduced touch may be a risk factor for children developing feeding disorders.

Treatment.

The treatment model for Infantile Anorexia, as developed by Chatoor and colleagues (2002), focuses on the internal regulation of eating according to hunger and fullness. The model consists of three specific components. First, the parents must understand the child's temperament and high level of arousal. The therapist compares the mother's description of the infant's temperament to his or her own evaluation. The therapist explains that the child's characteristics described as "unstoppable", "negative", and "emotionally intense", can be looked at from a different perspective. In contrast, the characteristics can be described as "sensitive", "alert", and "inquisitive". These characteristics can become absorbed by interaction and play that the child does not recognize their own sensations of hunger or fullness. The child has difficulty recognizing his or her own hunger and satiety and physiological needs become a lesser priority in comparison to curiosity, stimulation, and parental attention. The therapist helps the parents understand that the child is more interested in exploring and interaction with the parents than eating. The child is so engaged with the environment that he or she does not notice feelings of hunger. This distraction with the environment requires that the child constantly be redirected during mealtime, encouraging him or her to focus on eating the meal and recognizing feelings of hunger and fullness. The child needs structured mealtimes and stricter limit setting, however it is also more difficult to set limits with these children because they are incredibly strong-willed.

The second component of treatment investigates the parents' eating history, to help the parents relate to the child's difficulty. The parents' relationship with their own parents while growing up will also be explored, looking at the difficulties the parents have in setting limits for their own children for provocative behaviors during feeding. The therapist will help the parents to identify if past experiences affect or even interfere with current parenting strategies. The therapist also asks the parents to reflect on their own regulation of eating with the understanding of a possible genetic component of the disorder.

After these first two aspects of treatment have been explored and firmly grasped, the parents are then provided with a set of behavioral techniques and feeding guidelines. The guidelines teach parents how to give the child more autonomy during feeding while also setting limits on inappropriate behavior. The parents must control when, where, and what the child is offered to eat, but the child has the ability to control how much he or she wants to eat. These techniques will allow the child to learn how to internally regulate eating based on feelings of hunger and fullness. The child should be on a feeding schedule, spacing meals four hours apart with no snacking in between. This includes drinking milk from the bottle or breast. By maintaining these time intervals, the child has a chance to truly experience hunger. In addition to feeding guidelines, the parents are also trained on how to implement effective time-outs with their child. The time-out guidelines teach the child to accept limits and learn self-calming.

Chatoor and colleagues (1997) applied this treatment model to 20 infants in an open clinical trial. At a follow-up 6 months to 2 years later, the mothers of 17 of the 20 infants reported that the children had learned to recognize hunger, increased food intake, and gained weight at a faster rate. The other three mothers who still had concerns regarding their child's food intake did report that they were unable to implement the feeding and behavioral guidelines.

For the 17 mothers that were able to implement the feeding guidelines and gave positive reports, evidence is encouraging that this model is very effective in treating children with Infantile Anorexia.

A longitudinal study was conducted by Lucarelli and colleagues (2007) to follow children who were diagnosed and treated for Infantile Anorexia. The children were initially diagnosed between 6 months and 3 years of age and received nutritional and psychological counseling. Investigator followed-up with the children again when they were 4-6 years of age and again at 7-8 years of age. When first evaluated, the children were equally distributed with 1/3 of the children showing severe, 1/3 moderate, and 1/3 mild malnutrition. At the first follow-up when children were 4-6 years of age, 46% showed mild, 22% moderate, and 13% severe malnutrition. At 7-8 years of age, 58% showed mild and 21% showed moderate malnutrition, and 21% of children had normalized their weight. Reports showed that most of the children continued to have eating problems.

The longitudinal study also showed that these children showed greater separation anxiety, school phobia, sleep disturbances, somatic complaints, and oppositional behaviors than the control group. The children's mothers showed distress, depression, anxiety, somatization, bulimia, and oral control. This study has made evident the slow recovery of children diagnosed with Infantile Anorexia and the vulnerability to other psychopathology.

A Treatment Study to Facilitate Internal Regulation of Eating

A controlled treatment study to facilitate internal regulation of eating for children with Infantile Anorexia was conducted between 2000 and 2005. The specific goal of the study was to facilitate internal regulation of eating by helping parents understand their child, providing them

with feeding guidelines to set up regular mealtimes, and addressing difficulties in setting limits to the child's oppositional behaviors during mealtime.

The study consisted of 70 toddlers ranging in age from 12 to 42 months. Of the children 90% presented with mild malnourishment and 10% with moderate malnourishment. The toddlers were assigned to one of two interventions including six treatment sessions over a period of 3 months. Intervention I involved Psycho-educational Treatment with Parent Training in Feeding Guidelines and "Time Out" procedures. Intervention II included the Control Condition in addition to Parent Training in Feeding Guidelines and "Time Out" procedures. In Intervention II, during the first 2 sessions, rather than addressing the child's temperament and the parents' eating history and background, the parents were given questionnaires to fill out regarding the child's temperament and were shown a videotape demonstrating typical development during a child's first 3 years of life.

Subjects were then evaluated at several follow-up visits after completion of treatment. The first follow-up was conducted 1 to 2 months after treatment. Nutritional data was assessed, measuring the children's length/height, weight, head circumference, ideal body weight and height, and ideal body weight and height percentiles (Appendix A, B, C, D). After the first follow up, no significant difference was demonstrated between groups. However, there was a significant improvement of their ideal body weight, from 85% to 88% for the control group and from 86% to 88% for the treatment group. There was also significant improvement with the interactions between mother and toddler during feeding.

A Follow-up Study of Infantile Anorexia

Currently, a study is being conducted as a follow-up to the treatment study aimed at facilitating internal regulation in children with Infantile Anorexia. The specific aim of the current study is to examine the long term effect of the treatment of Infantile Anorexia on four aspects of the children's lives: the children's eating behavior, anxiety and externalizing behavior, cognitive development, and the parents' stress and psychopathology.

It is expected that the treatment helped the children to internally recognize hunger and fullness to normalize their eating behavior. Additionally, it is expected that the treatment will have given the children a sense of control, preventing the development of anxiety or behavior disorders, and will remove conflict in the parent-child relationship, facilitating cognitive development. It is hypothesized that the removal of stress from parent-child interactions will also relieve parental stress and parental anxiety or depression. These treatment results are best expected with early diagnosis and treatment intervention when the child is only mildly malnourished.

The study will evaluate the children, now between 6 and 11 years of age, who participated in the treatment study. A control group of 25 healthy children with no past or current history of feeding problems will also be recruited. The children will be matched by age, race, gender and socio-economic background.

Procedures

Before the first visit, the research coordinator explains the study to the parents over the phone and mails several questionnaires to the family to be filled out and bring to the first visit.

The questionnaires to be filled out are:

1. The Child History Questionnaire (Chatoor et al., 2002)
2. Children's Eating Behaviour Questionnaire (CEBQ) (Wardle et al., 2001)

3. Child Behavior Checklist for ages 6-18 (CBCL 6-18) (Achenbach & Rescorla, 2001)
4. Eating Attitudes Test (EAT-26) for the parents (Garner et al., 1982)
5. My Food Likes and Dislikes (Saxena et al., 2001)

During the first visit, the research coordinator again explains the study to the parents and the child and goes over the informed consent and assent forms. After these forms have been completed, the parents and child meet with the nurse practitioner to complete an interim medical and feeding history. The nurse practitioner performs a medical examination, measure, and weights the child. The nurse practitioner will use the following questionnaires:

1. Medical Intake Interview
2. Eating Disorders Interview for School Age Children
3. Parent's Follow-up Interview for IA and SFA
4. Rating of Eating Disorder Severity

The child will then meet with the psychologist for psychometric testing with the Wechsler Intelligence Scale for children (Wechsler, 2003). Following the intelligence testing, the family will be given the following questionnaires to be filled out at home and brought to the second visit:

1. The Symptom Checklist-90-Revised (SCL-90-R) by Derogatis, 1994
2. The Parenting Stress Index (PSI) by Abidin, 1995
3. The State Trait Anger Expression Inventory (STAXI-2) by Spielberger, 1999
4. Screen for Child Anxiety Related Disorders (SCARED) by Birmaher et al., 1999
5. The Children's Eating Attitude Test (ChEAT) by Maloney et al., 1988, 1989
6. The Nutritional Supplements Questionnaire by Williams, et al., 2009

During the second visit, Dr. Chatoor will interview the child with The Development and Well-Being Assessment (DAWBA) by Goodman et al., 2000. After the interview, Dr. Chatoor will discuss with the families any questions or concerns regarding the child's eating and growth or behavior.

Measures for the child.

As taken from the Protocol for A Follow-up Study of Infantile Anorexia (Chatoor, 2009):

The Child History Questionnaire (Chatoor et al., 2001): This questionnaire assesses race, religion, family structure, socioeconomic status and a child's medical/developmental history since birth. It will be used to gather data in these areas:

- i. *Demographics:* The child's age, gender, race and the family's socioeconomic status will be assessed via questions regarding the parents' occupational status and educational level.
- ii. *Medical History:* The medical history information will also be used in the clinical assessments to rule out medical conditions that could explain a child's feeding or eating problems (e.g., gastroesophageal reflux or cardiac problems).

Anthropometric Measures of Growth Deficiency: Children's growth status will be assessed by the following measurements: weight, length/height, and head circumference, using methods described by Gibson (1990). The nurse practitioner will take these measurements. For assessment of growth deficiency, we will use the criteria defined by Waterlow et al. (1977).

- i. *Acute Malnutrition:* Weight per height reflects current or "acute" nutritional status. The reference "normal" is 50th percentile weight for height (Kuczmarski et al., 2000). The current weight divided by this number provides the percent of ideal body weight. Mild, moderate and severe acute malnutrition corresponds with 80-89%, 70-79%, and less than 70% of ideal weight, respectively.
- ii. *Chronic Malnutrition:* "Chronic" malnutrition is assessed by the child's height for age. The child's actual height will be divided by the height that corresponds to the 50th CDC percentile for age, or "ideal height." Mild, moderate, and severe chronic malnutrition corresponds with 90-95%, 85-89%, and less than 85% of ideal height, respectively.

The Development and Well-Being Assessment (Goodman, et al., 2000): The Development and Well-Being Assessment (Goodman et al., 2000). The Development and Well-Being Assessment (DAWBA) is a structured interview designed to generate psychiatric diagnoses on 5-17 year olds. This parent interview takes roughly 50 minutes to administer as it uses a mixture of closed and open questions.

Children's Eating Attitudes Test (Maloney et al., 1988, 1989): The Children's Eating Attitudes Test (ChEAT) is a modified version of the Eating Attitudes Test (EAT) by Garner and Garfinkel (1979). The ChEAT is a self-report measure made up of 26 items that are rated on a 6-point scale. The ChEAT is typically scored on the total score only, however through a factor analysis similar to that used with the EAT three subscales were derived: dieting, restricting and purging, and food preoccupation (Maloney et al., 1988, 1989). The test-retest correlation across a 3-week interval was 0.81 for the total score in elementary school children and a Cronbach's alpha for the total score of 0.76 in elementary school children and 0.87 in middle school children. The ChEAT showed high validity when it correlated significantly with self-reported weight management behavior and self-reported body dissatisfaction (Verhulst & van der Ende, 2006).

Children's Eating Behaviour Questionnaire (Wardle et al., 2001): The Children's Eating Behaviour Questionnaire (CEBQ) is a parent-report form used to measure a child's eating style

for research into the early detection of eating disorders or obesity. The CEBQ is made up of 35 items that are rated on a 5-point scale which are scored on eight subscales: food responsiveness, enjoyment of food, emotional overeating, desire to drink, satiety responsiveness, slowness in eating, emotional undereating, and fussiness. The test-retest correlations of ratings by parents of community children across a 2-week interval were 0.52 for Emotional overeating, and 0.64 for Emotional undereating, and ranged from 0.83 to 0.87 for the rest of the subscales. The Cronbach's alpha ranged from 0.72 to 0.91 in the subscales (Verhulst & van der Ende, 2006).

My Food Likes and Dislikes (Saxena et al., 2001): My Food Likes and Dislikes is an unpublished instrument. It lists 10 food groups ranging from grains/breads to fruits and vegetables to meats and seafood. The child is asked whether he/she eats the food listed and if not, why the child does not eat the food. The number of foods eaten by the child and the number of foods rejected will be added up separately and the ratio of those two will be calculated.

The Child Behavior Checklist for ages 6-18 (Achenbach. & Rescorla, 2001): The Child Behavior Checklist for ages 6-18 (CBCL/6-18) consists of 118 items that describe specific behavioral and emotional problems as well as two open-ended items in which the parent or guardian can report any additional problems. This measure obtains information for 20 competence items covering their child's activities, social relations, and school performance. Using a 3-point scale, parents rate their child for how true each item is now or was within the last six months. The CBCL/6-18 yields scores on internalizing, externalizing, and total problems as well as scores on DSM-IV related scales. The scales included are: anxious/depressed, withdrawn/depressed, somatic complaints, social problems, thought problems, attention problems, rule-breaking behavior, and aggressive behavior. It is one of the most widely used outcome measures.

Screen for Child Anxiety Related Emotional Disorders (Birmaher et al., 1997; 1999; 2000): The purpose of the Screen for Child Anxiety Related Emotional Disorders (SCARED) is to assess anxiety symptoms in children. SCARED has two versions: parent version and child version. Both versions will be used in the study. Both are comprised of 41 items that are rated on a 3-point scale where a total score of anxiety can be found. There are also five subscales which include: panic/somatic, general anxiety, separation anxiety, social phobia, and school phobia. SCARED demonstrates strong internal consistency, test-retest reliability, and discriminative validity (Birmaher et al., 1997).

Wechsler Intelligence Scale for Children-4th Edition (Wechsler, 2003): The Wechsler Intelligence Scale for Children-4th Edition (WISC-IV) is used to measure a child's intellectual and cognitive abilities. The WISC-IV provides four index scores: verbal comprehension, perceptual reasoning, working memory, and processing speed. This is a widely used measure that has high internal consistency and construct validity.

The Nutritional Supplements Questionnaire (Unpublished: Williams, J., Marriage, B., Garleb, K., Kerzner, B., Hirsch, R., & Chatoor, I.): The Nutritional Supplements questionnaire is a parent-report form used to measure a child's experience with nutritional supplements. The questionnaire is made up of 28 items, most of which are yes/no or multiple-choice questions.

The questions ask about previous and current use of supplements and the child's acceptance of those supplements.

Measures for the parents.

As taken from the Protocol for A Follow-up Study of Infantile Anorexia, 2009:

The Parenting Stress Index, 3rd Edition (Abidin, 1995): The Parenting Stress Index, 3rd Edition (PSI) is a parent self-report designed to measure enduring qualities of the parent-child system contributing to stress and dysfunctional parenting. The PSI is made up of 120 items which are intended to identify dysfunctional parent-child systems. It yields a total of three scores: the total stress score and the child and parent characteristics that help identify the source of stress in the family. Both the child and parent characteristics are further broken down and measured in separate subscales. The child characteristics has six subscales: Distractibility/Hyperactivity, Adaptability, Reinforces Parent, Demandingness, Mood, and Acceptability. And the parent characteristics have seven subscales: Competence, Isolation, Attachment, Health, Role Restriction, Depression, and Spouse.

This measure has been used before treatment and will help to understand any ongoing conflict between child and parent and any changes in the parent's stress levels. We will also examine whether the parents of the children who were receiving PediaSure at the time of the initial evaluation were experiencing less stress than those without PediaSure.

Eating Attitudes Test (Garner & Garfinkel, 1979; Garner et al., 1982): The Eating Attitudes Test (EAT-26) was designed to be a screening instrument for the detection of eating disorders in non-clinical populations. The EAT-26 is comprised of 26-items and has three subscales that represent global measures of eating attitudes and behaviors: dieting, bulimia and food preoccupation, and oral control. The psychometric properties of this measure have been well documented (Garner et al., 1982).

Symptom Checklist-90-Revised (Derogatis, 1994): The purpose of the Symptom Checklist-90-Revised (SCL-90-R) is to evaluate psychological problems and symptoms of psychopathology in parents. The SCL-90-R is a 90 item measure scored on a 5-point scale. There are 9 primary symptom dimensions: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism and 3 global indices: global severity index, positive symptom distress index, and positive symptom total. Its use in many studies exhibits its reliability and validity.

The State Trait Anger Expression Inventory-2 (Spielberger, 1999): The State Trait Anger Expression Inventory-2 (STAXI-2) is designed to measure anger in both an emotional state and as a personality trait. The STAXI-2 consists of 57 items with six scales, five subscales, and an anger expression index. The six scales are: state anger, trait anger, anger expression-out, anger expression-in, anger control-out, and anger control-in. The first three subscales fall under the state anger scale: feeling angry, feel like expressing anger verbally, and feel like expressing anger physically. The last two subscales fall under the trait anger scale: angry temperament and

angry reaction. The STAXI-2 is a reliable measure that correlates with other personality scales and shows internal consistency. Construct validity has also been reported by the author. This measure has been used before treatment and will be used to see whether there has been any change in the parents' experience of anger after treatment. We will also examine whether the parents of the children who were on PediaSure at the time of the initial evaluation experience less anger than those without PediaSure.

Data Analysis

As described in the Protocol for A Follow-up Study of Infantile Anorexia (Chatoor, unpublished 2009):

Data analysis will be completed on two levels. The first will be descriptive analyses to compare all of the measurements in Tables 1 and 2 between study groups. Table 1 will consist of measurements for the two treatment groups, and Table 2 will be measurements of the two treatment groups and the control group.

To compare the measurements in Table 1 for the treatment groups, repeated measures analysis of variance will be used. To compare measurements in Table 2 for the treatment groups with measurements of the control group, one-way analysis of variance will be used.

The second level of data analysis will be analytic. This analysis will determine which measurements best discriminate between the two treatments groups and between the treatment groups and controls. "Discriminant analysis will be used to select measurements in a stepwise model building approach that independently contribute to separation of the study groups. *P*-values for tests of the null hypotheses that the regression coefficients are equal to zero in the population will be used to reflect the relative independent contribution of each of the measurements. To be included in the model, a *P*-value of 0.10 or less will be required. To be considered to have a statistically contribution, a *P*-value of 0.05 or less will be required" (Chatoor, unpublished Protocol, 2009).

Additional secondary analyses will be conducted to examine whether children placed on PediaSure before the initial evaluation by the Multidisciplinary Feeding Disorders Team differed in growth parameters from those not placed on PediaSure. The parents of these two groups will also be examined to compare their level of parenting stress (PSI) and level of anger at the time of initial evaluation and after treatment.

Table 1a. Measurements used to compare children in the two treatment groups

Instrument	Scales
Feeding History	Diagnostic Categories
Child Behavior Check List (CBCL/6-18)	Internalizing Externalizing
Nutritional Supplements Questionnaire	Supplement Use
	Child's Acceptance

Table 1b. Measurements used to compare parents of children in the two treatment groups

Instrument	Scales
Parenting Stress Index (PSI)	Acceptability Demandingness Mood Distractibility/Hyperactivity Adaptability Reinforces Parent Depression Attachment Restriction of Role Sense of Competence Social Isolation Relationship with Spouse Parent Health
State Trait Anger Expression Inventory (STAXI-2)	State of anger Temperament Reaction Suppress Express Control

Table 2a. Measurements used to compare children in the treatment study to controls

Instrument	Scales
Children's Eating Behaviour Questionnaire (CEBQ)	Food Responsiveness Enjoyment of Food Emotional Over-eating Desire to Drive Satiety Responsiveness Slowness in eating Emotional Under-eating Fussiness
The Development and Well-Being Assessment (DAWBA)	Developmental Difficulties Separation Anxiety Specific Phobia Social Phobia Panic Agoraphobia Post Traumatic Stress Obsessions and Compulsions Generalized Anxiety Depression Hyperactivity Behavior Issues Very Thin Focus on Weight and Food Loss of Control Avoidance of Weight Gain Motor Issues Vocal Tics
Screen for Child Anxiety Related Emotional Disorders (SCARED)	Panic/Somatic General Anxiety Separation Anxiety Social Phobia School Phobia
Child Behavior Check List for 6-18 year-olds (CBCL/6-18)	Anxious/Depressed Withdrawn/Depressed Somatic Complaints Social Problems Thought Problems Attention Problems Rule-Breaking Aggressive Behavior
Children's Eating Attitude Test (ChEAT)	Total Score Dieting

	Restricting and Purging Food Preoccupation
Wechsler Intelligence Scale for Children (WISC-IV)	Full Scale Verbal Comprehension Perceptual Reasoning Working Memory Processing Speed
My Food Likes and Dislikes	Total number of foods refused divided by total number of foods offered
Nutritional Supplements Questionnaire	Supplement Use
	Child's Acceptance

Table 2b. Measurements used to compare parents of children in the treatment study to parents of controls

Instrument	Scales
Eating Attitudes Test (EAT-26)	Total Score Image Preoccupation Food Preoccupation External Focus
Parenting Stress Index (PSI)	Acceptability Demandingness Mood Distractibility/Hyperactivity Adaptability Reinforces Parent Depression Attachment Restriction of Role Sense of Competence Social Isolation Relationship with Spouse Parent Health Life Stress
State Trait Anger Expression Inventory (STAXI-2)	State of Anger Temperament Reaction Suppress Express Control
Symptom Checklist 90-Revised (SCL-90-R)	Somatization Obsessive-Compulsive Interpersonal Sensitivity Depression

	Anxiety Hostility Phobic Anxiety Paranoid Ideation Psychoticism
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Results

At this point in the study, there are too few subjects to report on specific nutritional data and no statistically significant conclusions can be made. Additionally, to protect the identity and any private information of the children who have completed participation in the follow-up study, complete quantitative data will be released.

Discussion

Children diagnosed with Infantile Anorexia were treated using structured guidelines focusing on feeding at mealtimes and behavior. Several children have been seen for the follow-up study to assess the effectiveness of treatment on the child's feeding behaviors and development. While only several subjects have been seen for the follow-up study, the results of their progress and development are indicative of what may be observed in other children. These specific cases have made evident the significance of successfully implementing the feeding and behavioral guidelines.

More subjects are scheduled to complete the two follow-up visits and data will continue to be collected. With a larger sample, statistical analyses can be done to evaluate several relationships. Analysis will be done comparing the full-treatment and partial-treatment groups, examining any relationships with continued feeding problems, parent-child conflict, cognitive

and physical development, and psychopathology. Analysis on data from a larger sample will also indicate if there has been significant developmental improvement in children who received the full-treatment, marked by growth in weight and height. It is intended that the data will indicate whether the feeding and behavioral guidelines are effective in long-term treatment of IA. Such conclusions cannot be made at this point and more subjects must complete the study.

If the proposed label for Avoidant/ Restrictive Food Intake Disorder is included in DSM-V incorporating diagnostic criteria for specific subtypes, considerable attention will be given to this area of research. Further studies and research are fundamental to this area in order to assess and treat infants and young children suffering from feeding disorders. Families, researchers, and clinicians must recognize the importance of diagnosing and treating a child with a feeding disorder. If left untreated, the child is at serious risk for malnourishment, and long-term effects that may include delayed growth and acquired psychopathology. This longitudinal study will provide information on significant long-term effects and directions that should be taken for the treatment of IA and other feeding problems in children. Further longitudinal studies will be essential to refining treatment of feeding disorders in infants and toddlers, examining effective techniques and assessing the long-term effects of the disorders that must be considered in diagnosis and intervention. This study should be the first of many examining treatment and long-term effects in children and will present significant progress in the upcoming direction of research in feeding disorders of infants and young children.

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