

PARENTAL INFLUENCE ON PEDIATRIC FEEDING DISORDERS

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The purpose of this study was to investigate parental influence on treatment progression in children with feeding disorders. Children diagnosed with a feeding disorder were recruited with their parents at the Children's House at Baylor ($N=22$; 11 boys, 11 girls). Caloric intake was recorded daily as outcome measures of treatment progression. It was hypothesized that the initial parental participation would delay the child's progress as measured by caloric intake. Patient's average caloric intake (measured in grams) for 3 days prior to parents entering the room was compared to the average caloric intake measured for 3 days after the parents entered the room. A paired t -test was performed on the averaged caloric intake three days pre and post-parental presence, yielding significant results: $t(21) = 3.17$, $p = .005$. Caloric intake was greater prior to parent involvement ($M = 811.17$) as compared to after the parent entered the room ($M = 704.88$).

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INTRODUCTION

Background

Feeding disorders occur in approximately 25-40% of toddlers and school-aged children and range from mild to severe (Tarbell & Allaire, 2002). It is estimated that about 25% of normally developing infants and about 35% of children with developmental disabilities have some type of feeding problem. These problems range from refusing to eat or drink by mouth, gagging, vomiting, eating a limited number of foods or textures, and depending on tube feedings (Lindberg, Bohlin & Hagekull, 1991). Other symptoms include coughing or choking while eating or drinking, drooling excessively during feeding, difficulty chewing or drinking, liquid leaking out of nose, poor weight gain, and frequent respiratory infections or pneumonia. Feeding disorders that affect growth are later linked to cognitive deficits, behavioral issues, and eating disorders (Chatoor, Ganiban, Surles, & Doussard-Roosevelt, 2004).

Some children with severe feeding disorders undergo invasive oral procedures and some may require tube feeding. These children experience months of feeding-related procedures and are not able to regulate their appetite. This may create a food aversion, which again leads to an increase in the necessity of the feeding tube and continues the vicious cycle of dependence (Tarbell & Allaire, 2002). Severe feeding disorders may be the result of a chronic condition including those infants who survived premature birth. These children may present with a number of medical conditions that involve respiratory, cardiac, gastrointestinal, metabolic, or neurological systems. The medical condition alone may cause pain and discomfort for the child during feeding. This causes a suppressed appetite and fatigue for the child. Treatments surrounding the medical condition such as tube feeding, restricted diets, and surgery also negatively affect the feeding process (Franklin & Rodger, 2003).

Overall, children with feeding disorders experience a number of aversive events surrounding feeding. The infant may avoid food in order to prevent the anticipated pain, discomfort, or experience of intense anxiety (Benoit, Green, & Arts-Rhodas, 1997; Chatoor, Ganiban, Colin, Plummer, & Harmon, 1988). Aversive responses are crying, gagging, coughing, reaching, vomiting and escape behaviors such as arching backward, squirming and crawling away (Benoit & Coolbear 1998). Chatoor and colleagues (2001) developed the following operational diagnostic criteria: 1. the infant demonstrates food refusal after a traumatic event or repeated traumatic events to the oropharynx or esophagus (e.g., choking, severe gagging, vomiting, reflux, insertion of nasogastric or endotracheal tubes, suctioning, force-feeding), 2. the event(s) triggered intense distress in the infant, 3. the infant experiences distress when anticipating feedings (e.g., when positioned for feeding when shown the bottle or feeding utensils, and/or when approached with food), 4. the infant resists feedings and becomes increasingly distressed when force-fed.

Feeding is a highly integrated activity that involves motor skills, including oral motor skills, behavioral control in feeding, and appetite regulation. Typical children follow a progressive feeding pattern starting with the consumption of liquids (3 to 4 months old). The child then consumes cereals and baby foods at 4 to 6 months, soft solids at 6 to 9 months, table-texture foods at 12 to 14 months. Higher textured foods may require more advanced oral motor skills. Early or late progression through these phases may create a feeding problem. Some children may not have developed enough motor strength and as a result have not properly learned the skills involved in eating. Some may not have been exposed to a variety of foods and textures (Patel, Piazza, Layer, Coleman, Swartzwelder, 2005). Other children may have learned to associate negative behaviors with feeding. Some of these children may have a posttraumatic

feeding disorder (PTFD). PTFD is one type of feeding problem in children who refuse to eat and have an associated distressing experience involving the mouth, nose, throat, and esophagus. The occurrence of PTFD continues to increase as result of medical procedures involving the mouth, nose, and throat (Benoit & Coolbear, 1998).

Past literature has classified feeding disorders based on organic or nonorganic etiologies (Tarbell & Allaire, 2002). Organic factors include physiological abnormalities, neuromuscular conditions, allergies, and acute infectious diseases. Organic factors however, are not sufficient to explain the child's feeding problems (Werle, Murphy, & Budd, 1993). Instead, the current literature suggests a combination of etiologies that include physical, social, developmental, behavioral, and environmental issues (Tarbell & Allaire, 2002). While the etiology of feeding disorders is unknown, Burklow, Phelps, Schultz, McConnel, & Rudolph (1998) found 5 different ways to help explain why some children develop a feeding problem. She noted that these disorders may be a result of: 1. structural abnormalities, 2. neurological conditions, 3. cardio-respiratory problems, 4. metabolic dysfunctions, or 5. behavioral contingencies. Behavioral contingencies included feeding difficulties that resulted from psychosocial difficulties (poor environmental stimulation or negative feeder-child interactions), negative behaviors shaped from reinforcement (selective food refusal or rumination), and/or emotion based difficulties (phobias or conditioned emotional reactions). While most children had more than one of the above conditions, about 85% had a behavioral component associated with negative feeding (Burklow et al., 1998). For this reason, behavioral interventions are common for children with feeding disorders.

Treatment of Feeding Disorders

Researchers have applied a number of treatment interventions for children with feeding problems. These include behavioral-based programs, family-oriented therapy, and interdisciplinary treatment programs (Tarbell & Allaire, 2002). As noted, due to the high incidence of behavioral problems in children with feeding disorders, researchers focus on behavioral interventions. Specific techniques have included using specific prompts when presenting food, providing praise, pairing nonpreferred food with preferred food, ignoring disruptive behavior, using time-out, or physical guidance (Werle et al., 1993).

Research indicates that treatment interventions that incorporate behavioral strategies may be most effective in treating children with feeding disorders (Blissett & Harris, 2002).

Researchers suggest that the caregivers should begin with previously accepted food and then modify the food one change at a time by either changing the taste, texture, or quantity. It is recommended that each feeding session should end on a positive note if possible and if not, the session should end at a preset time. Tarbell & Allaire (2002) developed an effective 3-fold treatment plan which included an acquisition phase, fluency phase, and finally generalization. During acquisition, the child learns the new behavior through prompting, shaping, modeling, and feedback. During fluency training, the child practices the new behavior and receives reinforcement to increase the speed and accuracy of the task. Then during the generalization phase, the child performs the new behavior in a number of settings. Throughout this process, appropriate rewards are important in reinforcing the appropriate behavior and extinguishing inappropriate behavior (Blissett & Harris, 2002).

One type of behavioral strategy involves the manipulation of antecedents or consequences. These techniques include, stimulus fading, presentation of preferred and

nonpreferred foods, positive reinforcement and extinction (Bethke, Pruett, Oberdorff & Layer, 2003). Benoit & Coolbear, 1998 distinguish between feeding behaviors as a result of either classical or operant conditioning. They note that feeding behaviors that result from classical conditioning are dependent on stimuli that precede the behavior and are minimally affected by punishments and rewards (consequences). Feeding behaviors that result from operant conditioning are dependent on stimuli that follow the behavior. Parental presence during feeding may serve as a discriminatory stimulus in that it precedes the child's feeding and reinforces the child's behavior. Therefore, the feeders' response to the child's behavior during meals might maintain or extinguish the target behavior (Benoit & Coolbear, 1998). Treatment interventions that target the parents may be most effective in treating children with feeding disorders (Blissett & Harris, 2002).

Behavioral interventions are only as successful as their ability to generalize from the clinic setting to the natural environment. Thus it is important to train parents throughout the intervention process (Werle et al., 1993). Since the majority of feeding behavior occurs in the home, the caregiver's ability to implement the intervention is important (Bethke et al., 2003). Werle et al. (1993) investigated the effects of a behavioral parent-training program on parents who have a child with a feeding disorder. The behavioral intervention group included parent instruction, discussion, handouts, role plays, behavioral rehearsal during meals, verbal feedback following meals, and occasional videotape review of a feeding session. They found that parent training was an important component in increasing food intake in children with feeding disorders. More specifically, they found that positive changes in the parents' behavior during the feeding session increased appropriate feeding behaviors by each child (Werle et al., 1993).

Treatment for feeding disorders may include a multidisciplinary team. The team may work to strengthen muscles of the mouth, increase tongue movement, increase tolerance to different foods or liquids, and coordinate suck-swallow breathe pattern. The first step in treatment is to treat any underlying medical disorder which is normally done by a gastroenterologist. Nutritionists then develop meal plans and work to provide adequate nourishment for the child. Behavioral psychologists help the child and the family in dealing with behavioral issues associated with feeding. Occupational and speech therapists work on the child's food aversions, oromotor (mouth and tongue) skills, and fine motor skills that interfere with feeding. Many of the children with feeding disorders are afraid of new tastes and textures (neophobia), thus, speech therapists offer foods with different consistencies and textures for children who are extremely sensitive to having things in his or her mouth. Finally, social workers act as a liaison and provide resources for the families. For example, they work with the insurance companies to provide services and offer support for the families (Burklow et al.,1998).

Research consistently demonstrates that a multidisciplinary intervention is the most effective treatment for children with feeding disorders. Benoit & Coolbear, 1998 used a three-part treatment program for children with post-traumatic feeding disorders that included: 1. physiological and environmental changes to promote good eating habits, 2. nutritional monitoring, and 3. behavior therapy (flooding). Tarbell & Allaire, (2002) found that the most effective form of treatment for tube-fed children was the behavioral programs that were centered on contingency management treatment (extinction, time-out, positive reinforcement, and shaping). Benoit, Wang, & Zlotkin (2000) randomly assigned children with feeding disorders into either a nutritional intervention group or behavioral interventional group. The nutritional intervention provided ways to manage meals and environmental recommendations. In addition

to the components of the nutritional intervention, the behavioral intervention also used behavioral techniques such as extinction. Approximately half of the behavioral group was weaned off their feeding tube compared to none of the nutritional group.

FACTORS AFFECTING TREATMENT

Parent-Child Relationship

Many researchers view feeding disorders as a relationship disorder (Fledman, Keren, Gross-Rozval, & Tyano 2004). Providing adequate nutrition and food for development are vital to the early parent-child relationship. The first interactions between mother and child revolve around feeding (Franklin & Rodger, 2003). When a child encounters an early feeding problem, the feeding relationship between mother and child is disrupted. Feeding is associated with pain and mother with feeding. Associations of the mother with pain intensifies the feeding problem (Franklin & Rodger, 2003).

Several studies compare parent interactions in children with feeding disorders and in those without a disorder. Chatoor and colleagues (1997) found positive dyadic reciprocity between mother and infant during feeding to be a high discriminating factor between normal controls and feeding disordered infants. Berkowitz & Senter (1987) found that during direct observations of the interaction, the mother of the child with a feeding disorder avoided physical closeness and showed less affection. Polan & Ward (1994) added that parents of children with a feeding disorder displayed less unintentional touch (accidentally brushing against the child) and engaged in less play with their child. However, during feeding, the mothers showed a higher need for control and high intrusiveness (forceful touch). In response to the negative behaviors by the parent, the child engaged in oppositional behavior. The child refused food and often pushed the mother away during the feeding session (Franklin & Rodger 2003; Fledman et al., 2004). This rejection interfered with healthy attachment and the development of a positive parent-child relationship. This becomes problematic because research suggests that frequent affection and

touch by the parent results in better neurobehavioral development and better cognition (Fledman et al., 2004).

Parental Stress and Anxiety

Caretaker Role

The difficulty in forming a functional bond between parent and child may be due to the high level of stress involved in the child's regimen. Caring for children with feeding problems contributes to high stress levels in the parents. The parents have additional tasks related to the child's disorder including medical treatment, nutritional care, and in some instances hospitalization. Parental anxiety about the child's feeding habits may contribute to the stress encountered during the feeding interaction. This high level of stress prompts the mother to continue the negative interactions and forceful feeding which intensifies the child's feeding problem (Fledman et al., 2004).

Studies show that parents of children with disabilities experience higher levels of stress. The severity of the disorder, increased dependence of the child, social factors, and caregiver characteristics are all psychosocial factors that contribute to parental stress (Raina, O'Donnell, Schwellnus, Roenbaum, Kinh, Brehaut, Russell, King, Wong, Walter, & Wood, 2004). Parents are often physically overwhelmed with the increased number of demands (Graves & Ware, 1990). The parents must carefully observe food intake, medication, restrictive diets, and must constantly monitor oral feeding and/or tube feeding which adds to the stress (Franklin & Rodger, 2003). Parents make judgments about the child's demands, and if these demands are high and appear beyond the capabilities of the parents, the parents experience stress. The parent will likely employ some type of coping mechanism in order to reduce the stress (Brehm, Kassin,

Fein, 2004). While some parents adapt and cope, others employ ineffective coping strategies such as force feeding (Raina et al., 2004). When parents use these inappropriate coping mechanisms, disruptive and often counterproductive behavior by the child is the inevitable byproduct. The child continues to refuse food and the parent continues to experience stress (Graves & Ware, 1990).

Role of Anxiety on Parent-Child Interactions

Whaley, Pinto, and Sigman (1999) were the first to examine the interaction between an anxious mother and her child compared to a normal control mother and her child. Anxious mothers were defined as having an anxiety disorder or related disorder based on the Anxiety Diagnostic Interview Schedule for DSM-IV (ADIS-IV). They observed parent child interactions in 18 clinically anxious mothers compared to 18 normal control mothers. They found that anxious mothers provided less warmth and exhibited more control. Woodruff-Borden, Morrow, Bourland, & Cambron, (2002) found similar results. They suggested that anxious parents as measured by the ADIS-IV interact differently with their children than non-anxious parents. They found that anxious parents were withdrawn and disengaged from tasks that involved both them and their child. When the parents were engaged with their child, the productivity was lower and they were less likely to praise their child (Woodruff-Borden, Morrow, Bourland, & Cambron, 2002).

METHODS

Purpose

The purpose of this study was to investigate how the presence of a parent during the feeding session affects the child's caloric intake. It was hypothesized that caloric intake would decrease when the parent entered the feeding session. To test this hypothesis, the child's daily caloric intake was recorded as the dependent measure and averaged three days prior to parents entering the feeding room and three days after the parents entered.

Participants

Children between the ages of 23 months and seven years old diagnosed with a feeding disorder were treated at Our Children's House at Baylor in Dallas, TX. The patients and their parents were housed in the clinic for an eight-week intensive multidisciplinary pediatric feeding disorder treatment program with a focus in behavior intervention. The program used a differential reinforcement method in order to increase feeding behavior through reinforcement and extinguish inappropriate behavior during the feeding sessions (Miller, 2006). Based on the current literature, it is comparable to other programs found in other similar studies.

Procedure

Feeding Sessions

All participating children received multidisciplinary treatment including, medical supervision by physicians, nursing staff, a nutritionist, a psychologist, a speech and occupational therapist and a social worker. The behavioral component of the feeding therapy consisted of positive reinforcement of targeted behaviors of accepting bites, chewing and swallowing. All

aversive behaviors, including food refusal, gagging, vomiting were ignored. Behavioral protocols were standardized yet adjusted to accommodate individual differences in preferred reinforcement. Initial protocols ranged from continuous reinforcement in which the child was allowed continuous access to the reinforcer as long as he/she accepted food, to taking bites of food in a 1:1 ratio of reinforcement (i.e, the child had access to the reinforcer following one bite).

All feeding sessions were conducted in a room that contained a table, two chairs, a booster seat, and a one-way mirror. Total grams consumed (premeal minus postmeal food weight) and protein grams were measured. Meals were conducted five times per day for 25 minute sessions. The child was fed in a chair facing either the parent or therapist (depending on the phase of the program) at arm's length. The order of food presentation was selected at random and each item was placed in a separate bowl. All food and liquid was measured prior to the feeding session. Food was measured in grams on a scale and liquid is measured using 30 ml medicine cups. All food and liquid was again measured at the end of the session in the same manner.

At mealtime, the person administering the food made direct eye contact and say, "It's time to eat." Once the child attended, therapist or the parent said "Take a bite." Reinforcement was provided when acceptance occurred. Reinforcement included verbal praise such as "Good eating, you took a bite." When the child did not accept the entire bolus, the same bolus was presented until it was accepted or until the session ended. Inappropriate and disruptive behaviors (head turns, refusal, crying, etc.) were ignored. At the end of the meal, the therapist or parent said "The meal is over, it is time to ____ (do the next activity)." Then the child was taken out of the chair and was cleaned. Total grams and protein intake were calculated by a nutritionist and

recorded daily for each child. A summary of what was eaten was also recorded on a tracking sheet (See Appendix 1 for sample).

Feeding Protocol

Parent involvement in the program was structured into four phases; 1. parent observation outside of feeding room, 2. parent observation inside feeding room, 3. participation in feeding, and 4. caregiver feeding with the final goal of successful meals with the parent.

Phase 1: Parent Observation Outside Feeding Room

During this phase of parent observation, parental visitation was limited to evenings only during the week and on weekends. Therefore, the child participated in therapies and feedings during the day without primary caregiver involvement. The focus of this phase of treatment was to structure behavioral expectancies and eliminate habits not conducive to normal eating or improve behaviors conducive to normal eating. The parents began observing feeding sessions from behind a one-way mirror, often times with a psychologist, social worker or therapist. This initiated the training process.

Phase 2: Parent Observation Inside Feeding Room

Phase two of parent participation began once the child adjusted to the routine and made some progress in the feeding sessions. The focus of phase two of treatment was to reestablish parental presence in the daily routine. The parent stood in the back of the room and observed the therapist feeding the child. The goal of this phase was for the child and the parent to become accustomed to participation in treatment while making progress with oral intake.

Phase 3: Parent Participation in Feeding

Phase three included parent participation in feedings when the child has shown progress in accepting food. Parent participation was initiated once the child increased an intake of food, reduced disruptive behaviors, and adjusted to parent involvement in other therapy sessions. Parents began to observe from the back of the room and moved closer to the child and feeding therapist over sessions. Parents were expected to separate from their child a minimum of 15-30 minutes prior to the meal and were situated in the feeding room before the child entered the room. During the meal, parents praised their child verbally as cued by the feeder or by following the lead of the feeder. The emphasis of this phase of treatment was to continue training and introduce caregivers into the feeding sessions. The goal of this phase of treatment was to maintain progress while the parent is in the room.

Phase 4: Caregiver Feeding

During the final phase, parents began feeding meals with the therapist in the room. The therapist provided support and feedback. During the last 5 to 7 days parents were expected to feed the majority of the meals.

RESULTS

Caloric intake for each child was averaged across 3 days prior to parental entry and compared to a 3-day average of caloric intake post-parental entry. The means and standard deviations of caloric intake pre and post parental presence are presented in table 1. A paired t -test was performed on the averaged caloric intake 3 days pre and post parental presence, yielding a significant difference $t(21) = 3.17, p = .005$. Caloric intake was greater pre-parent involvement ($M = 811.17$) as compared to after the parent entered the room ($M = 704.88$).

Table 1

Pre and Post Caloric Intake

	N	Minimum	Maximum	Mean	Std. Deviation
Pre Calories	22	215.33	1515.00	811.17	336.35
Post Calories	22	259.98	1686.55	704.88	353.20
Age in months	22	23.00	84.00	44.95	17.41
Valid N (listwise)	22				

DISCUSSION

This present study examined parental presence on treatment progression in children with feeding disorders. It was hypothesized that the initial parental participation would delay the child's progress as measured by caloric intake. Caloric intake pre-parental presence was compared to post parental presence using a paired *t*-test. There was a significant decline in caloric intake following parental entry into the feeding environment.

It is recognized that any further investigation of this phenomenon needs to include a control condition in which an individual *other than the primary parent* enters the room during feeding to ensure that the drop in caloric intake found in this study was specifically the result of *parental* presence. This will help determine if the decrease in caloric intake was a result of the parent's presence or simply just a change in the child's feeding environment.

If it is parental presence, the decrease in protein and caloric intake upon entrance of the parent into the feeding room might suggest a disrupted parent-child relationship. Research has shown that maternal care during infancy guides the child's behavioral responses (Caldji, Tannenbaum, Sharma, Francis, Plotsky, & Meaney, 1998, p. 5335). Since behavior problems in ill children are typically the result of problems in the family and not due to the actual illness, intervention at the family level may be the most effective treatment (Graves, J., Ware, M., 1990).

Research also indicated that parents with children with feeding disorders experience increased stress (Raina et al., 2004). The parents' anxiety about the feeding process may have played a role in the decreased food intake in the present study. Rosenbaum and Ronen (1997) suggested that children are able to pick up on their parent's emotions, particularly anxiety (Wood, Mcleod, Sigman, Hwand, & Chu, 2003; Woodruff-Borden, Morrow, Bourland, & Cambron, 2002). Studies have also revealed that poor anxiety regulation skills are passed from

parent to child. In other words, parents who model poor coping strategies are more likely to have children who lack an ability to evaluate and regulate their own fear and anxiety levels effectively (Woodruff-Borden et al., 2002). In this regard, the parent was a naturally occurring feedback mechanism by which the child learned to regulate physiological and emotional responses (e.g. approach, avoid). Therefore, it is of utmost importance that parents monitor and regulate their own emotional arousal (e.g. fear, anxiety, frustration) in order to promote normal eating and adequate oral nutritional intake.

Further research directed toward the parents involved in pediatric feeding programs seems warranted based on these preliminary results. A measurement of parental stress in relation to the child's feeding outcome may also provide useful information in testing the current experimental hypothesis. Closer observation of the parent-child interaction during feeding compared to therapist interaction during feeding may help develop training programs for the parents. Interventions and training directed toward the parent of a child with a feeding disorder could show faster treatment outcome for the child and thus, facilitate implementation of shorter interventions. Overall, training parents who have a child with a feeding disorder may improve treatment outcome for these children.

APPENDIX
FOOD INTAKE/CALORIE DATA SHEET

Food Intake/Calorie Data Sheet

Child: _____

Date _____

	Meal	Amount Consumed	Extra Food/ Amount Added	Calories per jar**	Calories	Protein
Food Offered 1:	7:30					
Food Offered 2:	7:30					
Food Offered 3:	7:30					
Drink Offered:	7:30					
				Total Cal. for Meal:		
Food Offered 1:	9:30					
Food Offered 2:	9:30					
Food Offered 3:	9:30					
Drink Offered:	9:30					
				Total Cal. for Meal:		
Food Offered 1:	11:30					
Food Offered 2:	11:30					
Food Offered 3:	11:30					
Drink Offered:	11:30					
				Total Cal. for Meal:		
Food Offered 1:	2:00					
Food Offered 2:	2:00					
Food Offered 3:	2:00					
Drink Offered:	2:00					
				Total Cal. for Meal:		
Food Offered 1:	5:00					
Food Offered 2:	5:00					
Food Offered 3:	5:00					
Drink Offered:	5:00					
				Total Cal. for Meal:		
				Total Cal. for Day:		

** To assist dietary with conversions, please indicate total calories in the jar of baby food being used.

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