Mealtime Behavior and Parent-Child Interaction: A Comparison of Children with Cystic Fibrosis, Children with Feeding Problems, and Nonclinic Controls[1]

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Abstract

Examined the role of family interaction factors in dietary compliance problems reported by parents of children with cystic fibrosis (CF). The family mealtime interactions of children with CF, children with feeding problems and nonclinic controls were observed, and parents monitored children's eating behavior at home. Parents of children with CF reported more concern about feeding problems and recorded more disruptive mealtime behavior than parents of nonclinic children. Observational data showed children with CF to display overall rates of disruptive mealtime behavior not significantly different from either comparison group. Mothers of children with CF were observed to engage in higher rates of aversive interaction with their child than did mothers of nonclinic controls. Fathers of children with CF reported lower marital satisfaction than fathers of controls. Both mothers and fathers of children with CF reported lower parenting self-efficacy than non-CF families. Clinical implications are discussed.

KEY WORDS: cystic fibrosis; dietary compliance; mealtime behavior; family interaction.

Cystic fibrosis (CF) is a genetically determined metabolic disorder. It is the most common lethal or semilethal genetic disease of people of Caucasian descent, transmitted as an autosomal recessive trait. Incidence is estimated at approximately 1 in 2,000 births (Wood, Boat, & Doershuk, 1976). Advances in recombinant DNA probe techniques have enabled the localization of the CF gene to chromosome 7, and suggest that the disease is almost certainly due to a single gene defect (Rommens et al., 1989).

Clinically, CF is characterized by the triad of chronic pulmonary disease, pancreatic insufficiency, and elevated sweat electrolytes. Many other manifestations of CF may also be present, resulting from a heterogenous group of abnormalities in exocrine gland function involving bronchial, pancreatic, sweat, salivary, biliary, and reproductive gland dysfunction (Matthews & Drotar, 1984). In the absence of specific treatment for the underlying defect, treatment is aimed at prevention and treatment of the progressive clinical manifestations of the disease. The typical therapeutic regime is complex, involving a modified diet to achieve an adequate absorbed protein-energy intake, with vitamin and nutritional supplements which often include orogastric support. In most cases, physiotherapy is required twice a day with bronchodilators and prophylactic antibiotic treatment obligatory. The treatment regimen is usually administered in the home by parents, with hospitalization occurring if the patient's condition deteriorates.

One of the dietary recommendations made for children with CF is a daily calorie intake between 120 and 150% of the recommended daily allowance (Hubbard, 1985). Malabsorption, persistent low-grade fevers due to lung infections, increased exertion in breathing, increased metabolic rates, and regular performance of chest physiotherapy are all thought to considerably increase the energy needs of children with CF above those of healthy children (Hubbard, 1985). Appetites of older children with CF are frequently depressed and the average calorie intake of preadolescents is only 80% of the recommended daily allowance (Chase, Long, & Lavin, 1979).

This finding is consistent with reports that malnutrition is common in the CF population and approximately 85-90% of patients have clinically evident pancreatic insufficiency with consequent malabsorption of fat and protein (Orenstein & Wachnowsky, 1985). Malnutrition has been found to be strongly associated with a decline in pulmonary functioning, to exacerbate respiratory infections, to adversely affect the patient's recovery from acute respiratory infections, and to be associated with early death (Gurwitz, Corey, Francis, Crozier, & Levinson, 1979). Furthermore, severe malnutrition during the first year of life can adversely affect mental and physical development (O'Brien, Repp, Williams, & Christopherson, 1991) and even produce brain damage (Stoch & Smythe, 1976).

Family factors play an important role in determining the child's, and indeed, the family's illness experience. According to Kerns (1994), families have a pervasive influence on health beliefs, adherence to health care recommendations, the symptomatic expression of disease, and the course of the disease itself. Parents of preadolescent children with CF must ensure that their child cooperates with necessary treatments, since the child's clinical status may be compromised if the child is persistently uncooperative. Parents often feel under pressure to ensure their child receives adequate nutritional intake, making children's normal appetite fluctuations more stressful for parents. A survey of a sample of children with CF found that the majority of parents experienced compliance-related problems with their children (Sanders, Gravestock, Wanstall, & Dunne, 1991). Dietary regimens and mealtime behavior were identified as problematic by 70.4% of parents, while compliance with physiotherapy and medication were reported as problems by 89.1 and 67.9% of parents, respectively. Across all age groups studied, from preschoolers to adolescents, few parents reported an absence of compliance problems with prescribed treatment.

Compliance problems in children with CF may be related to several aspects of family functioning, including patterns of parent-child interaction, the parents' level of psychological distress, and the social support available to the parent. Some evidence supports a relationship between parents' feeding practices and food refusal problems. For example, Bowen, Stark, Bradlyn, and Passero (1990) compared the parent-child interactions of mildly malnourished children with CF to average weight non-CF peers. The parents of children with CF gave twice as many commands as parents of control children. The parents of younger children with CF tended to spoonfeed their children while controls did not. Children with CF refused food over three times more often than control children and were away from the table almost twice as often. Other observational evidence has linked parents' feeding practices to food refusal problems in children without CF but with persistent feeding problems. Sanders, Patel, Le Grice, and Shepherd (1993) found that parents of children with feeding problems were more negative and coercive in their feeding practices than parents of control children. They engaged in higher rates of aversive instruction giving, aversive prompting, and negative eating-related comments than parents of nonclinic controls. Children with feeding problems engaged in higher rates of food refusal, noncompliance and oppositional behavior, and lower rates of chewing than controls during family mealtimes. Coercive parental interactions were significantly correlated with food refusal and noncompliance in children.

Although these findings point to the importance of parents' feeding practices in understanding compliance problems at mealtimes, it is unknown to what extent feeding difficulties are specific to children with CF or are a shared characteristic of children who are difficult to feed, regardless of disease status. It is also unknown how parents of children with CF interact with their other children who do not have CF. No studies of feeding problems in children with CF have controlled for disease status by including appropriate comparison groups of nonorganic- based problem feeders, using comprehensive multimethod assessment of children's feeding difficulties. In addition, no studies have explored whether compliance problems in children with CF are a function of general adjustment difficulties. Hence, the present study included a measure of child adjustment and compared the family mealtime interactions and nutritional intake of children with CF, children with feeding problems without organic disease, and nonclinic children.

To understand patterns of parent-child interaction, the broader social context of the family must be addressed. Due to the life-threatening nature of the illness, parents of children with CF may experience more psychological distress than other parents, which in turn may affect patterns of parent-child interaction. Four aspects of a parent's psychological functioning are important to family interaction patterns: level of depression, sense of parenting competence, availability of social support, and satisfaction with the marital relationship (e.g., Grych & Fincham, 1990). These variables are associated with the development of behavioral problems in children, but are potentially modifiable. These variables may also complicate the treatment process and may need to become targets for intervention (Geiss, Hobbs, Hammersley-Maerklein, Kramer, & Henley, 1992). Hence, the present study sought to develop a descriptive profile of the adjustment problems and mealtime interactions of children with CF and their parents, to better understand the problems they experience in dietary management.

To date, no comparison of children with CF and children with feeding problems has been conducted. However, due to the common reports of dietary compliance problems in children with CF and children with feeding problems, we predicted that these two groups of children would display similar patterns of mealtime behavior. We predicted that children with CF would display more disruptive mealtime behavior than nonclinic controls and parents of children with CF would report more behavior management difficulties during mealtimes and at other times, than parents of nonclinic children. We also predicted that parents of both children with CF and children with feeding problems would show higher levels of aversive behavior and lower levels of positive behavior than controls. Due to the incurable nature of CF, we also predicted that parents of children with CF would experience more psychological distress as measured by higher levels of depression and lower levels of marital satisfaction, social support, and parenting competence than parents of nonclinic children.

METHOD

Participants

Twenty-five children with CF (ages between 12 and 84 months) and their parents were recruited from the Brisbane metropolitan area to participate in the were not specifically chosen because of reports of feeding or compliance difficulties. Children's clinical status was measured by the number of physical symptoms present, from a list of 28 common clinical presentations (M = 0.7, *SD* = 1.0) and a rating of the severity of the child's clinical status at the time from 1 (minimal) to 4 (severe) *(M = 1.7, SD = 0.7)*. The Schwachman-Kulczycki Rating Scale (Schwachman & Kulczycki, 1958) was also used to assess the clinical status of each child with CF. This scale provides a total score out of 100, as a measure of clinical functioning based on four categories: case history; pulmonary physical findings and cough; growth and nutrition; and chest X-ray. The mean for the sample *(M = 90.4, SD = 10.4)* indicates good health considering their disease status. Parents of children with CF also completed the Cystic Fibrosis Problem Checklist (Sanders et al., 1991), which records parents' reports of the difficulties experienced with different aspects of their child's treatment. In this sample, 71.4% of parents reported problems with their child's mealtime behavior and compliance with diet, 90.5% reported physiotherapy compliance problems, and 66.7% reported compliance with medication problems.

Forty-five similar-age children without CF (25 children with feeding problems and 20 nonclinic controls), from the same geographical location, formed comparison groups. Children in these groups were matched with the sample of children with CF on age, gender, and parents' socioeconomic status. The children with feeding problems were included in the study if their parents had sought help for their child's feeding problems and the child had a history of persistent significant feeding difficulties over a minimum period of 3 months. Nonclinic controls were reported by their parents to be good eaters or normal for their age.

Children were excluded if they met diagnostic criteria for affective disorder, psychosis, or developmental delay. No children had to be excluded on these grounds. At the time of entry into the study, biographical data and feeding and medical histories were obtained. Table I provides a summary of demographic characteristics of the sample.

A preliminary analysis was conducted to determine the comparability of the three groups on sociodemographic variables (see Table I). A series of analyses of variance (ANOVAs) for continuous variables and chi-square analyses for categorical variables failed to show significant group differences on any measure *(p > .05)*, suggesting the three groups were sociodemographically similar.

Table I. Demographic Characteristics

Variable	Children with CF		Children with feeding problems		Nonclinic controls		
	M	*SD*	*M*	*SD*	*M*	*SD*	*p*
Child's age (months)	47.6	21.0	47.9	19.4	43.8	17.9	ns
Range (months)	15–80		17–79		16–72		
Mother's age (years)	33.22	4.0	33.0	4.6	33.2	4.3	ns
Father's age (years)	34.1	5.5	34.7	5.4	34.2	5.4	ns
Mother's occupational status[a]	4.8	1.0	4.2	1.3	3.9	1.2	ns
Father's occupational status[a]	4.3	1.4	4.0	1.2	3.9	0.9	ns
No. of siblings	1.3	0.9	1.2	0.7	1.2	0.8	ns
	n	*%*	*n*	*%*	*n*	*%*	
Child's gender							
Male	13	52.0	13	52.0	8	40.0	ns
Female	12	48.0	12	48.0	12	60.0	ns
Marital status							
2 parent	17	68.0	22	88.0	18	90.0	ns
1 parent	6	24.0	3	12.0	2	10.0	ns

[a]Based on 6-point occupational prestige scale (Daniel, 1983). Lower scores indicate higher occupational status.

Measures

Clinical Assessment. Each child's weight was measured using a seated balance scale following a standardized protocol. Height was assessed using a stadiometer with a standardized protocol. Height and weight measurements were converted to standard deviation scales for age and sex, to produce Z scores for weight for age, height for age, and weight for height (Anthro 1; Sullivan & Gorstein, 1990). These assessments provide accurate and sensitive measures of nutritional status in children, and have been used widely in published nutritional studies of healthy children and children with various diseases.

Nutritional Intake. A 7-day Mealtime Record Form was completed by parents to record amount of food and drink presented to, and consumed by, the child. Nutrient analysis of the dietary intake was conducted by a dietitian, using a standard computer program (Diet 1; Australian Government Publishing Service, 1991). Daily nutrient intake was calculated and interpreted as a percentage of the Recommended Daily Intake (RDI) adjusted for the child's weight for age. Parents of children with CF also recorded calorie supplements given with meals.

Observed Mealtime Interaction. Videotaped mealtime interactions were analyzed by two trained coders, using the revised Mealtime Observation Schedule (MOS; Sanders, Le Grice, & Turner, 1993). The MOS records 17 categories of child feeding behavior: 6 appropriate (request food, food preparation, bite, chew, verbal interaction, and engaged activity) and 11 disruptive (food refusal, spit food out, playing with food, holding food, noncompliance, complaint, aversive demand, physical negative, oppositional behavior, leaving the table, and noninteraction); and 15 categories of parent behavior: 9 nonaversive (praise, contact, specific instruction, vague instruction, prompt, eating comment, presentation of food, removal of food, and social attention) and 6 aversive (contact, specific instruction, vague instruction, prompt, eating comment, and social attention). The schedule uses an interval time sampling procedure, recording the presence of behavior categories in consecutive 10-second time blocks. From this coding procedure, several summary measures were derived: the percentage of intervals of appropriate behavior from the target child (during which no disruptive behaviors occurred); the percentage of intervals of inappropriate or disruptive behavior from the target child; the percentage of intervals of positive behavior from the mother directed towards the target child (during which no aversive behaviors occurred); the percentage of intervals of aversive behavior from the mother directed towards the target child; the percentage of intervals of positive behavior from the mother directed towards siblings (if present); and the percentage of intervals containing aversive behavior from the mother directed towards siblings.

Interobserver agreement was assessed by a third observer who served as a reliability checker, coding one fifth of the tapes coded by each of the primary observers. Kappa coefficients assessing the reliability at the most stringent level, on individual behavior categories, were deemed satisfactory (.71 for parent behavior and .77 for child behavior).

Parental Perceptions of Child Mealtime Behavior. Parents' perceptions of their child's eating and mealtime behavior were assessed using the Feeding Behavior Checklist (FBCL), a clinical tool designed to screen for childhood feeding problems (Turner, Sanders, & Wall, 1996). The FBCL is a therapistadministered checklist that records the presence of 21 problem behaviors over the preceding month, and whether these behaviors are perceived by parents to be problematic.

Mealtime Behavior at Home. As well as nutrient intake, the Mealtime Record Form incorporated monitoring of mealtime behavior at home, including the occurrence of disruptive behavior (e.g., food refusal, complaints, leaving the table, spitting or vomiting, and playing with food); and a rating by the parent of the difficulty of the meal on a scale from 1 *{easy)* to 7 *(difficult).* Measures obtained from this monitoring include the percentage of meals containing disruptive behavior, the average difficulty rating per meal and the average difficulty rating for the most difficult meal of the day for the week of monitoring. These measures have been shown to differentiate between children with feeding problems and nonclinic controls (Sanders, Patel, Le Grice, & Shepherd, 1993).

Child Adjustment. All parents completed the Child Behavior Checklist (CBCL; Achenbach 1991, 1992) to assess their perception of their child's general behavior and adjustment, the CBCL is a well documented and reliable measure of children's adjustment. Measures drawn from the CBCL include scores for the total behavior problems and for the internalizing and externalizing subscales.

Parent Adjustment. To determine the extent to which adjustment difficulties were present within the family, parents completed a number of self-report questionnaires, including: the Abbreviated Spanier Dyadic Adjustment Scale (ADAS; Sharpley & Cross, 1982) which provides an index of marital satisfaction and has been shown to differentiate reliably between distressed and nondistressed couples (Sharpley & Rogers, 1984); the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), an inventory that is used widely in the assessment of depression in adults; the Social Support Inventory (SSI; Procidiano & Heller, 1983), which records perceived levels of support from both

family and friends, and is reported to have satisfactory internal consistency and validity; and the Parenting Sense of Competence Scale (PSOC; Gibaud-Wallston & Wandersman, 1978), which assesses parents' report of satisfaction and efficacy with their parenting role and is reported to have moderately sized coefficients for test-retest reliability and internal reliability (Gibaud-Wallston & Wandersman, 1978).

Procedure

The sample of children with CF was recruited by inviting all parents of appropriate-age children with CF attending the CF Clinics at the Royal Children's Hospital and the Mater Children's Hospital to participate in a study of children's feeding and nutrition. Parents were sent a letter of invitation to participate in the study and were then followed up by telephone or at their next clinic visit. Parents who declined to participate generally did so because of existing research involvement or difficulty completing assessment instruments due to time commitments. Informed, written consent was obtained from parents prior to inclusion in the study. A detailed clinical assessment was completed by the child's physician to ascertain the child's current clinical status.

The comparison groups of children with feeding problems and nonclinic controls were recruited through media outreach and visits to local preschools requesting volunteers to participate in a study of children's feeding and nutrition. Informed, written parental consent was obtained prior to inclusion in the study. Children with feeding problems initially underwent a medical examination to determine any current organic pathology contributing to their feeding problem. Families of children with feeding problems were offered treatment at the conclusion of the assessment study.

Each participant underwent a standardized assessment which included an intake interview with parents and assessment of the child's height and weight. For the children without CF, the height and weight assessment took place at the Royal Children's Hospital outpatient department. The children with CF attended their usual clinic for this assessment. Parents were given a battery of self-report measures and the Mealtime Record Form to complete at home. To ensure accurate recording of dietary intake, parents were supplied with standard measuring cups and instructions on how to complete the Mealtime Record Form provided in a standardized video format (Children's Nutrition Research Centre and Behaviour Research and Therapy Centre, University of Queensland, 1990). At this time, arrangements were made for a research assistant to visit the family to videotape an evening meal in the home. Questionnaires and monitoring forms were left with the parents for completion and returned by post or collected at the home visit. Observations of children's eating and associated mealtime interaction were then conducted during an evening meal in the family home. For the mealtime observation session, parents were instructed to prepare a typical meal for their child and follow usual family routine, with all family members present who would normally be present for the meal. Standardized instructions were given as follows: "Act as you usually would for this meal. If any difficulties arise, deal with them in your usual way." Twenty minutes of the family mealtime interaction were recorded using a standard video camera, with the research assistant absent from the room.

RESULTS

Child Anthropometries and Nutritional Intake

Measures of the children's anthropometric status and nutritional intake (Table II) were analyzed using multivariate analysis of variance (MANOVA). This analysis showed a significant group effect, $F(2, 59) = 8.15$, $p < .001$. Subsequent univariate ANOVAs indicated that the group effect was significant for both weight for age and weight for height, but not for height for age. Tukey-HSD post hoc tests showed that the children with feeding problems had significantly lower weight for age than the nonclinic controls and

significantly lower weight for height than both children with CF and nonclinic controls. Children with CF did not differ from the nonclinic control group on any of the anthropometric measures.

Table II. Child Anthropometric Measures and Nutritional Intake[a]

Variable Measurement	Children with CF		Children with feeding problems		Nonclinic controls		df	F
	M	SD	M	SD	M	SD		
Weight for age (Z score)	0.17	1.23	−0.43	1.13$_a$	0.57	1.13$_a$	2, 62	3.97[b]
Height for age (Z score)	−0.11	1.46	−0.18	0.77	0.13	1.09	2, 62	0.41
Weight for height (Z score)	0.53	0.60$_a$	−0.29	1.22$_{ab}$	0.68	1.07$_b$	2, 62	6.00[b]
Nutritional intake								
Energy intake (% of R.D.I.)	133.9	25.5$_{ab}$	83.4	23.0$_{ac}$	112.5	23.6$_{bc}$	2, 59	24.08[c]
Protein intake (% of R.D.I.)	251.1	103.8$_{ab}$	192.9	61.9$_a$	143.0	43.4$_b$	2, 59	10.38[c]

[a]Means with the same *sub*script differ significantly using Tukey-HSD tests for planned comparisons between groups ($p < .05$).
[b]$p < .05$.
[c]$p < .001$.

Univariate ANOVAs also showed significant group effects for both energy and protein intake. As expected, the children with CF and nonclinic controls had significantly higher energy intakes than the children with feeding problems. Children with CF also had significantly higher intakes than nonclinic controls. There was wide variability in the CF group on the measure of energy intake, with less than a third reaching the maximal **RDI** of 150%. However, the mean for children with CF does fall in the recommended range. Children with CF also had significantly higher protein intakes than the nonclinic controls and children with feeding problems, although all groups had mean protein intakes above 100% of the **RDI.**

Observed Mealtime Behavior

Table III presents the percentage of intervals of occurrence of observed appropriate and disruptive child mealtime behavior, and mother to child positive and aversive mealtime interaction. Separate MANOVAs found significant group differences for the child behavior categories, $F(2, 61) = 1.75$, $p < .05$, and mother to target child interaction, $F(2, 61) = 2.33$, $p < .05$, but not for mother to sibling interaction. A series of univariate ANOVAs showed that there were group differences for the overall measures of appropriate/disruptive child behavior (complementary measures) and mother to target child aversive interaction. Tukey-HSD tests showed that the nonclinic controls displayed significantly lower levels of disruptive mealtime behavior and higher levels of appropriate mealtime behavior than the children with feeding problems. Children with CF did not differ significantly from either comparison group. Mothers of children with CF displayed significantly more aversive behavior towards the target child than mothers of nonclinic control children. There were no significant differences between groups on overall levels of positive maternal behavior directed towards the target child.

Table III also presents the individual child behavior categories on which the groups differed significantly. A series of univariate ANOVAs and Tukey-HSD tests showed that children with CF displayed significantly higher rates of noncompliance than nonclinic controls, and did not differ from children with feeding problems on this measure. However, children with CF played with food less frequently than children with feeding problems, but not nonclinic controls. Nonclinic controls displayed significantly higher levels of appropriate verbal interaction than children with CF.

Table III. Comparison of Observed Mealtime Interaction[a]

Variable Target child (% of intervals)	Children with CF		Children with feeding problems		Nonclinic controls		F (2, 61)
	M	SD	M	SD	M	SD	
Appropriate	61.2	19.7	51.4	22.9$_a$	70.8	17.0$_a$	5.03[b]
Appropriate verbal	5.0	4.0$_a$	5.6	9.0	10.3	4.9$_a$	3.74[b]
Disruptive	38.8	19.7	48.6	22.9$_a$	29.2	17.0$_a$	5.03[b]
Noncompliance	20.4	19.8$_a$	18.9	18.2	7.6	9.3$_a$	3.63[b]
Play with food	2.8	2.8$_a$	13.0	12.6$_a$	7.4	7.0	7.51[b]
Mother to child							
Positive	68.4	27.3	72.3	12.7	68.5	20.7	0.26
Prompt	10.9	8.9$_{ab}$	4.6	4.4$_a$	4.0	2.6$_a$	8.70[c]
Specific instruction	6.6	5.1$_a$	4.8	5.3	2.8	2.8$_a$	3.36[b]
Social attention	28.7	18.0$_a$	42.5	12.1$_a$	36.3	11.7	5.26[b]
Aversive	1.8	2.4$_a$	1.2	3.0	0.0	0.0$_a$	3.23[b]
Prompt	0.2	0.5$_{ab}$	0.0	0.0$_a$	0.0	0.0$_b$	4.61[b]

[a]Means with the same *sub*script differ significantly using Tukey-HSD tests for planned comparisons between groups ($p < .05$).
[b]$p < .05$.
[c]$p < .001$.

Individual mother-child interaction categories on which the groups differed significantly are also presented in Table III. A series of univariate ANOVAs and Tukey-HSD tests showed that mothers of children with CF engaged in higher rates of positive and aversive prompts to the target child than both comparison groups, and more positive specific instructions to the target child than nonclinic controls. Mothers of children with CF also displayed significantly less positive social attention toward the target child than mothers of children with feeding problems, but not nonclinic controls.

Mealtime Behavior at Home

Table IV summarizes parents' perceptions of their child's eating and mealtime behavior as measured by the Feeding Behavior Checklist and the Mealtime Record Form. Using MANOVA, a significant group effect was found, F(2, 55) = 5.86, $p < .001$. Univariate ANOVAs and post hoc Tukey-HSD tests showed significant group differences on all measures. The parents of children with CF and nonclinic controls reported significantly fewer disruptive behaviors' on the FBCL than the parents of children with feeding problems. However, parents of children with CF and children with feeding problems reported a significantly greater number of these mealtime behaviors to be problematic than did parents of control children (the number for children with feeding problems was significantly higher again than for children with CF).

Table IV. Comparison of Children's Mealtime Behavior at Home[a]

Variable Parental perceptions	Children with CF		Children with feeding problems		Nonclinic controls		df	F
	M	SD	M	SD	M	SD		
No. of problem behaviors present	6.7	4.4$_a$	9.8	3.0$_{ab}$	4.0	3.3$_b$	2, 59	12.62[c]
No. perceived as problematic	3.4	4.2$_{ab}$	8.7	3.1$_{ac}$	0.4	0.9$_{bc}$	2, 59	37.10[c]
Mealtime behavior at home								
% of meals with aversive behavior	37.9	29.6$_a$	44.3	28.1$_b$	15.1	19.4$_{ab}$	2, 61	6.93[b]
Average difficulty rating	2.0	1.0	2.3	1.2$_a$	1.2	0.3$_a$	2, 61	7.67[b]
Average rating most difficult meal	2.6	1.4$_a$	3.3	1.6$_b$	1.4	0.6$_{ab}$	2, 61	11.29[c]

[a]Means with the same *sub*script differ significantly using Tukey-HSD tests for planned comparisons between groups ($p < .05$).
[b]$p < .05$.
[c]$p < .001$.

Parents of children with CF and children with feeding problems recorded a greater frequency of aversive mealtime behavior than parents of controls. Average mealtime difficulty ratings showed children with feeding problems were seen by their parents as significantly more difficult to feed than controls but children with CF did not differ significantly from either comparison group. However, parents of both children with CF and children with feeding problems reported a significantly higher difficulty rating for the most difficult meal of the day than did parents of nonclinic controls.

Child Adjustment

Table V reports mothers' mean *T* scores from the CBCL, which measures parental perceptions of child behavior. MANOVA showed a significant effect for mothers' reports of child adjustment, $F(2, 59) = 2.20$, $p < .05$, but not for fathers' reports. Univariate ANOVAs showed group differences on the total score and the externalizing score as reported by mothers. Post hoc Tukey-HSD tests showed that mothers of children with CF and controls reported significantly lower levels of behavior problems in their children than mothers of children with feeding problems. No significant group differences were found between groups for mothers' reports of internalizing behavior problems. It should be noted that means on all measures from the CBCL fell within the nonclinic range for all groups.

Table V. Comparison of Child Adjustment Measures[a]

Report by mother	Children with CF		Children with feeding problems		Nonclinic controls		F (2, 59)
	M	SD	M	SD	M	SD	
CBCL							
Total	47.0	7.4$_a$	56.2	12.2$_{ab}$	48.2	7.4$_b$	6.12[b]
Internalizing	44.6	8.4	50.2	12.5	45.3	8.8	1.93
Externalizing	47.5	9.3	55.4	14.0	49.4	6.6	3.21[b]

[a]Means with the same *sub*script differ significantly using Tukey-HSD tests for planned comparisons between groups ($p < .05$).
[b]$p < .05$.
[c]$p < .001$.

Parental Adjustment

Table VI presents the means and standard deviations for parental adjustment measures. MANOVAs were conducted separately for mother and father adjustment measures and revealed a significant group effect for mothers' adjustment, $F(2, 42) = 2.06$, $p < .05$, and for fathers' adjustment, $F(2, 33) = 2.04$, $p < .05$. Univariate ANOVAs and subsequent Tukey-HSD tests showed that mothers differed significantly on the PSOC efficacy subscale, with mothers of children with CF reporting significantly lower feelings of parenting efficacy than mothers of children with feeding problems and controls. There were no significant differences between groups on measures of mothers' depression, social support, marital satisfaction or satisfaction with their parenting role.

A similar pattern of results is evident for fathers. Fathers of children with CF indicated a lower sense of parenting efficacy than fathers of controls and children with feeding problems. They also reported lower marital satisfaction than fathers of nonclinic controls, although they did not differ on this measure from fathers of children with feeding problems. No significant differences were found between groups on measures of fathers' depression or satisfaction with their parenting role. However, fathers of children with feeding problems did report significantly lower levels of social support from family than fathers of nonclinic control children.

Table VI. Comparison of Parent Adjustment Measures[a]

Variable Mother	Children with CF		Children with feeding problems		Nonclinic controls		df	F
	M	SD	M	SD	M	SD		
BDI	7.8	5.1	8.1	8.4	6.3	5.3	2, 58	0.43
PSOC								
Efficacy	22.0	6.3_{ab}	29.2	5.0_a	30.0	5.8_b	2, 46	5.04[b]
Satisfaction	37.2	7.8	36.5	6.8	38.3	8.6	2, 46	0.27
SSI								
Friends	15.3	4.3	15.6	4.7	15.6	3.9	2, 46	0.01
Family	10.2	7.9	15.4	5.6	16.0	4.2	2, 46	2.78
ADAS	22.0	6.5	22.0	6.9	26.1	4.3	2, 52	2.64
Father								
BDI	5.9	5.4	4.1	5.0	5.2	4.4	2, 45	0.63
PSOC								
Efficacy	22.3	7.3_{ab}	28.7	3.9_a	30.1	2.8_b	2, 35	7.04[b]
Satisfaction	35.0	2.4	39.6	7.3	37.5	4.1	2, 35	1.60
SSI								
Friends	11.2	6.1	14.0	4.5	12.0	5.8	2, 35	0.95
Family	14.2	5.6	13.0	5.9_a	18.2	2.9_a	2, 35	4.34[b]
ADAS	22.6	2.9_a	23.8	4.0	26.2	3.2_a	2, 46	3.88[b]

[a]Means with the same *sub*script differ significantly using Tukey-HSD tests for planned comparisons between groups ($p < .05$).
[b]$p < .05$.
[c]$p < .001$.

DISCUSSION

The present study extends the existing literature on the psychosocial aspects of CF by contrasting the mealtime interactions of children with CF and their parents with two comparison groups of children without CF: a group of children with feeding problems and a nonclinic control group. The present findings provide only partial support for the hypothesis that children with CF would be similar to children with feeding problems in their mealtime interactions and more disruptive than nonclinic children. In fact, parents of children with CF reported their child to display similar levels of disruptive mealtime behaviors to the nonclinic controls, but perceived these behaviors to be more problematic than did parents of nonclinic controls. Clearly, mealtimes are a difficult time for parents of children with CF because of the pressure to ensure their child receives adequate nutritional intake. Children with CF did not differ from either comparison group on observed disruptive behavior overall or the average difficulty of meals as reported by parents. However, when examining disruptive mealtime behavior as recorded by parents at home and parent's ratings of the most difficult meal each day, ratings for children with CF and children with feeding problems were significantly higher than those of controls. In addition, observed levels of mealtime noncompliance in children with CF were significantly higher than controls. These findings suggest that children with CF may not display consistently disruptive mealtime behavior, but may be more noncompliant or more difficult only at certain meals. This possibility warrants further investigation.

As predicted, observational data show that mothers of children with CF displayed higher levels of aversive behavior than mothers of controls. They also displayed lower levels of positive attention to their child during mealtimes, compared with mothers of children with feeding problems. Mothers of children with CF provided more prompts (instructions that result in compliance) to their child than both parents of children with feeding problems and controls. These findings extend the work of Bowen et al. (1990) who found that mothers of children with CF gave twice as many instructions as mothers of controls. Mothers of children with CF also gave more instructions (that did not result in compliance) to their child than controls. This high level of involvement and instructiongiving by parents of children with CF may increase the opportunity for noncompliance and result in the child becoming reliant on parental assistance. Unless a parent reduces the rate of instructions over time, children are unlikely to learn to eat independently.

There was no evidence that the mealtime problems of children with CF were associated with more global adjustment difficulties. Indeed, mothers of children with CF reported them to have significantly fewer behavior problems than children with feeding problems. This finding suggests that the behavior management problems experienced by many parents of children with CF are due to difficulty in managing the illness, rather than being indicative of serious child psychopathology. However, use off the CBCL may be less appropriate for populations with chronic illness where the nature of somatic complaints is less clear.

As predicted, both mothers and fathers of children with CF had lower ratings of parenting self-efficacy than parents of children with feeding problems and nonclinic controls, although there were no differences in levels of parenting satisfaction. This finding indicates that parents of children with CF are uncertain about the effectiveness of their own parenting skills. This uncertainty may be compounded by limited availability of practical child management advice for parents of children with CF.

Despite frequent conflictual encounters with children over food, there was no evidence of elevated levels of parental depression in either clinic group compared to parents of nonclinic children. Fathers of children with feeding problems reported lower levels of social support than controls, and fathers of children with CF reported lower levels of marital satisfaction than parents of nonclinic children. As poor marital adjustment is related to adverse outcomes for both children (Grych & Fincham, 1990) and adults (Sanders, 1995), future studies of children with CF need to determine what relationship, if any, exists between marital functioning and compliance problems in children. Since poor marital adjustment can affect parenting practices, increase the stress of parenting, and lead to aversive parent-child interactions (Margolin, Christensen, & John, 1996), marital interventions may be warranted for some families of children
with CF.

There are several implications of the present study to interventions for parents of children with CF. First, interventions designed to promote compliance with dietary recommendations should provide parents with effective nonaversive strategies to manage noncompliance and disruptive mealtime behaviors and guidelines about optimal instruction giving. Second, as both mothers and fathers of children with CF reported lower parenting self-efficacy than non-CF families, interventions should address parents' feelings of inadequacy, helplessness, and uncertainty about how to cope with their child's illness as well as expectations about their child's dietary intake. Third, psychosocial interventions to address parents' specific areas of family distress, such as marital functioning need to be developed. Such programs need to be evaluated systematically to determine the possible benefits to children with CF and their parents.

Limitations of this study must be taken into account when interpreting the results. It should be noted that the sample of children with CF were not severely ill or malnourished at the time of assessment, according to clinicians' ratings of disease severity. Consequently, the interactional difficulties and degree of psychological distress found in this study may represent a conservative estimate of the extent of the problems experienced in the families of the CF population as a whole, particularly in families where children's clinical status is more severe. As all families were volunteers, it is not known to what extent the present findings would generalize to the population. Although the children in each group were matched for age, it would be useful in future research to examine possible developmental differences in children with CF as appetites, degree of independent self-feeding, and parental expectations change over the infancy-toddlerpreschooler and school age periods. Although the MOS coding system differentiates between clinic and nonclinic populations (Sanders, Patel et al., 1993), it is not sensitive to developmental changes. For example, playing with food is coded as disruptive, but is age-appropriate in younger children. Future refinement of the coding system is suggested in order to take developmental changes into account. Greater exploration of developmental differences may lead to more effective behavior management strategies for parents of children with CF.

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