



## Efficacy of parent management training in reduction of children's feeding problems

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**Journal of Research & Health**  
*Social Development & Health Promotion*  
Research Center  
Vol. 7, No. 6, Nov & Dec 2017  
Pages: 1077- 1085  
DOI: 10.18869/acadpub.jrh.7.6.1077  
Original Article

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Received: 30 Dec 2013  
Accepted: 30 Jun 2014

How to cite this article: Zeinali Sh, Emanzadeh V, Mazaheri MA, Tahmasian K, Sadeghi MS. Investigating the efficacy of parent management training in reduction of children's feeding problems. *J Research & Health*2017; 7(6): 1077- 1085.

### Introduction

Children feeding is a complex process requiring not only effective coordination among muscles, but also effective interaction with mother and environmental factors [1]. Feeding problems are common in infants and young children [2]. It occurs in the first years of childhood and includes the set of behaviors that make children's eating difficult, affect the relationship between mother and child and may disappoint their parents[3]. Furthermore, having feeding problems for a long time may lead to severe weight loss or failure in gaining weight, stunted growth, cognitive and developmental delays and cognitive deficits [4].

Children feeding problems include highly selective eating, food refusal, observation

### Abstract

Feeding problems are common in infant and young children. These problems affect mother and child relationship. The current study sought to investigate the efficacy of parent management training in reducing children's feeding problems. The present study was a semi-experimental research based on pretest, posttest and follow-up design with a control group. 34 mothers whose children had feeding problems were chosen and randomly divided into control and experimental groups. Then, experimental group was intervened using training program for mothers for six sessions. Control group didn't receive any intervention. Mothers in the experimental and control groups were assessed in three time intervals (pretest, posttest and follow-up) by the questionnaire of feeding problems. Findings of repeated measure analysis indicated that training programs for parents significantly reduced the feeding problems. This finding confirmed that parent training program is an effective intervention for reducing feeding problems.

**Keywords:** Feeding, Hospital, Management, Parent

of negative behaviors during eating, very slow eating, being angry during mealtimes, pickiness, struggle for control and positive parental [5]. It is estimated that 25 to 35 percent of children suffer from different kinds of feeding problems [6].

Only 16 to 30 percent of feeding problems were influenced by genetic factors. In Casey's bio-psycho-social model, Physiological, behavioral and social factors play a more significant role in feeding problems than other factors [7]. It seems that physiological problems (anatomical abnormalities, sensory perceptual abnormalities, motor dysfunction, oral- motor dysfunction and respiratory, cardiac and gastrointestinal

problems) enormously affect children's feeding [8].

Beside physiological factors, social and behavioral aspects have a more noticeable role in feeding problems. In behavioral aspects, it is emphasized on unsuitable behaviors and habits but in social aspect, the relationship between mother and child in mealtimes is important [7]. Child's health conditions, physical problems, personal characteristics, dietary restrictions, experience of trauma, mother's health conditions may be indirectly effective on the caregiver-child relationship and lead to feeding problems [9]. Therefore, the identification of the effective factors on feeding problems and the treatment of such problems should be a priority.

During several studies, it was cleared parent's behaviors and their feeding styles, as food providers, are effective on children's eating behaviors and weight status directly or indirectly [10]. For example, the authoritative parental feeding style may contribute to children having healthy weights and lives [11].

Linscheid believes that two steps should be considered for intervention in feeding problems: first stage includes the identification of factors controlling child's food and second step involves child's behavior during eating and other life situations [12]. Treatment programs for feeding problems include behavioral intervention [13,14], cognitive-behavioral intervention [15], interactional therapy and family-oriented interventions [16]. Research indicates that feeding problems in children may effectively be treated by using behavioral interventions [13]. Research carried out for the treatment of children with feeding problems ranges from treatments focusing on antecedent manipulations to treatments emphasizing consequence manipulations [17,18].

Behavioral intervention procedures mostly include using appetite manipulation [13], positive attention, extinction, token economy [19], Observational learning [20], time-out [13], escape extinction [8]. Some researchers

believe that using specific prompts when presenting food, providing praise for eating; pairing non-preferred food with access to preferred food, ignoring mild disruptive behaviors, physical guidance are the other way for reducing feeding problems [20].

Several studies have suggested that reinforcement-based procedures lonely may be effective for decreasing feeding problem [21]. Also, another research done on feeding problems has suggested that negative reinforcement (such as non-removal of the spoon or physical guidance) often is effective on the treatment of feeding problem [22,23].

On the other hand, other studies have suggested that escape extinction is necessary for initial increasing and continuing food consumption [23]. Based on new methodologies, use of negative and positive attention is necessary to be reduced the behavior disorders in children's feeding [22]. Previous findings reveal the functional role of mothers training programs in the improvement of children's feeding behaviors [23]. The effectiveness of behavioral interventions is well documented in published reports that are generally single-subject designs, experiment designs and case reports [13,16,24,25]. For instance, Kerwin found that contingency management (differential attention) procedures using positive reinforcement and ignoring incorrect behaviors are well led to effective treatments [16]. William, Hendy, Knecht intervened 46 children with severe feeding problems through behavioral techniques and follow-up procedures after 12-months and 24-months indicated the endurance of intervention effects of treatment [26].

The effectiveness of behavioral interventions for pediatric feeding problems has been well documented. However, the application of these procedures in the real world is often more complex and difficult than it is reported by researchers [27]. Multiple factors such as the child's medical condition and history, parent efficacy, mother behavior may affect results [28,29]. Although some

previous research studied these techniques, due to complication of feeding problems treatment, few studies have investigated the effect of PMT (parent management training) and changing parent behavior by intervention procedure. For these reasons, present study was performed with purpose of investigating the efficacy of parent management training in reducing children's feeding problems. In the first, we tried to study combination of different behavioral techniques in each session (for example; appetite manipulation, escape extension, ignore and time out) and then we investigated the efficacy of parent management training or their feeding behavior change on child eating behavior.

### Method

The present study was a semi-experimental research based on pretest, posttest and follow-up design with a control group. Statistical population was all of mothers who came to medical care centers during 2 month. Thirty four mothers, who their children have feeding problems, were selected. Then, they randomly divided into two groups on the based of their telephone number (mother gave their telephone number to clinician and clinician chosen them randomly by dialing respectively to them. Parent management training with behavior intervention (16 participants) and control group (18 participants). Two participants in intervention group left treatment process before ending sessions because of their personal problem (such as going to another county). Before starting treatment program, all participations signed consent paper and completed feeding problem questioner. Prior to participation in this study, all medical and physiological problems for inadequate growth had been eliminated. After intervention sessions, post test was administered one week after ending treatment, and follow up procedures was conducted 5 months after treatment. Control group did not receive any intervention. Control group could receive feeding problem treatment after ending intervention. In the end, obtained

results from measures of intervention and control groups were compared with each other and analyzed during pretest, posttest and follow-up procedures.

Feeding Problems scale: The feeding problem scale, a 68-item scale designed to assess problematic feeding behaviors in children. It was performed on 34 mothers having children feeding problem. The items of this scale are: pickiness, food refusal, struggle for control, positive parental behavior. In the study on 93 mothers whose children had feeding problems, the internal consistency of subscales obtained 0.85, 0.76, 0.65 and 0.71, respectively [5].

Five-factor solution of Zeinali et al has confirmed a suitable validity for the Farsi version of these instrument. Internal consistency of this five-factor solution included identified mother satisfaction (0.83), eating behaviorproblem (0.77), feeling tension (0.65), eating different kind of food (0.67) and somatic symptoms (0.55). Also internal consistency of whole items was 0.75 [30]. The training program for mothers was consisted of six sessions (1.5 hour) per week. This educational package was designed based on intervention programs [18,31] and clinician designed sessions based on feeding problem treatment methods.

This instructive package is presented cooperatively and interactively, that is, mothers' opinions and suggestions were considered during sessions. In addition to, during and after sessions, some assignments were given to mothers. Ultimately, mothers' feelings about presented techniques and assignments in every session were discussed. Used techniques in these sessions mainly involved appetite manipulation, contingency management, positive reinforcement, ignoring, time-out, token economy, observational learning and extinction (Table 1). Success of any intervention depended on the child's motivation to change his or her current eating patterns. During intervention sessions, mothers should change their feeding behaviors.

**Table 1** Intervention program in feeding problem

First session	Definition of feeding problems, determine kinds of child feeding problems, present appetite manipulation for reducing snacks (for example it was said to mother not to give any thing to child before meal time).
Second session	Use positive attention for positive behavior in meal time, use ignoring negative behavior in meal time (for example it was said to mother that reinforce eating and ignore nagging)
Third session	Use token economy for eating different kind of foods and ignore mild negative behavior of child
Fourth session	Finding parents negative behavior and changing them, use extinction for reducing escape behavior (for example when the child refuse to eat, mother prompt child with spoon to eat)
Fifth session	Use time out for severe negative behavior (for example, behaviors such as pushing the spoon away, crying, turning the head away, and nagging can be treated by mild punishment in the form of a brief time-out).
Sixth session	Change some ideas in parent about food selectivity in children, relax parents in meal time (for example, mother change the idea that my child should eat every thing and replace with idea that my child can hate from some foods)

## Results

Rang of mothers age was 24-37 (M=29.26, SD=4.03), Children age was between 30 and 50 months (M=30.50 months, SD=4.5) and their breast-feeding durations was between 12 and 80 months (M=12.80 months, SD=7.5). 88% of children had breast-feeding

experience and 85% of them had constant feeding place. Furthermore mothers were the main feeders of 55% of children. Other descriptive results related to effective factors on eating problems were summarized in Table 2.

**Table 2** The comparison of feed problems scares obtained by intervention and control groups

Factors	Group	Pretest Mean (SD)	Posttest Mean (SD)	Follow1 Mean (SD)	Follow2 Mean (SD)
Feeding problem	Experiment	28.25(11)	23.93(9.2)	24.31(10.4)	23.68(10.3)
	Control	30.36(9)	30.55(6.5)	31.11(7.2)	32.2(8.3)
Eating behavior problem	Experiment	9.6(3)	7.4(2.5)	8.3(4)	8.1(4)
	Control	8.1(1.6)	8.13(1.6)	8.2(1.4)	8.4(1.4)
Mother satisfaction	Experiment	7.2(2.4)	7.9(1.2)	8.1(1.1)	8(1)
	Control	7.1(1.9)	7.1(1.2)	7.1(1.6)	7(1.6)
Feeling tension	Experiment	5.6(2.6)	4.7 (2)	4.7(1.9)	4.5(1.8)
	Control	6.4(1.3)	6.6 (1.4)	6.9(1.2)	7.1(1.4)
Eating different kind of food	Experiment	3.1(2)	3.1 (2)	3.2(2)	3.7(2.1)
	Control	4.7(2.1)	4.9 (2.1)	4.6(1.09)	4.6(1.8)
Having somatic symptoms related to feeding	Experiment	2.4(1.4)	2.6 (1.5)	2.1(1.4)	2.2(1.4)
	Control	3.2(2.1)	3 (1.8)	3.2(2)	3.3(2.1)

In the experiment group, the mean scores of feeding problem, feeling tension, eating behavior problem and having somatic symptoms decreased during posttest, follow-up 1 and follow-up 2. Also, the mean eating different kind of food and mother satisfaction increased in these stages in comparison with pretest. Results revealed that interventional

model was effective in reduction of feeding problems (Pillai's Trace=0.178, F=3.36, df=2,  $p<0.05$ ,  $\eta=0.178$ ). To test this hypothesis, two- way ANOVAs with repeated measures was performed (Table 3).

Result obtained from between group ( $p<0.001$ ) and within group ( $p<0.05$ ) revealed that feeding problem has been

decreased significantly during posttest, follow-up1 and follow-up 2. Also, according to results of posttests, follow-up1 and follow-up 2, there was a significant difference between scores mean of mothers' satisfaction both experiment and control groups ( $p < 0.05$ ).

Similar to these results, significant differences were observed in mean scores of eating behavior ( $p < 0.001$ ), feeling tension ( $p < 0.001$ ) and eating different kind of food ( $p < 0.001$ ) between experiment and the control groups.

**Table 3** The comparison of within and between group coefficients obtained different factors during intervention processes

Factors	F (within group)		F (between group)	
	(Time*group)	Time	Intervention	Eta partial coefficient
Feeding problem	5.48**	3.7*	19.4**	0.31
Mother satisfaction	3.25*	3.58*	0.02	0.04
Eating behavior problem	2.34	1.74	8.8**	0.17
Feeling tension	2.16	0.7	14.66**	0.26
Eating different kind of food	2.5	0.3	16**	0.15
Having somatic symptoms	1.6	0.1	2.1	0.06

$p < 0.05^*$ ,  $p < 0.01^*$

### Discussion

This study reveals that the training program for parents having children's feeding problems results in reducing feeding problems. Findings of the current study are consistent with results of other researches. They used behavioral techniques such as appetite manipulation, positive care, behavioral chart and imitation in their treatment packages [16,23,32]. Contreras et al revealed the influence of parenting training on mealtime behaviors of low-income African-American mothers' toddlers [33].

Elford et al considered the impact of parent behavior on child eating behavior in early years. A controlling maternal child-feeding style (e.g. using pressure to eat or restricting certain foods) has been associated with over consumption, fussy eating and low weight in child. Conversely, responsive child-feeding styles of mother (whereby children are allowed to regulate their own intake, they were encouraged to eat a range of foods and experience new tastes) are associated with healthier eating styles and more suitable weight. Results of this research confirm that responsive child-feeding styles is the best choice for mothers. This method is consist of low levels of pressure to eat, high levels of encouragement to experience new foods [34]. Findings revealed when mothers learn feeding

behavior, their satisfaction about children's eating behavior improves. It is believed that the main problem of these children is poor appetite which aggravates mother-child interaction, and the result of this problem is mother low satisfaction [35]. Findings support the hypothesis that the mother's satisfaction increases, especially after attending training programs related to their children's feeding problems. The link between the mother's satisfaction and the child's feeding problems has several possible explanations. Firstly, we consider that the child's bad behavior with respect to feeding problems is related to mother's bad behavior in mealtime. Secondly, the measurement process may be affected by the mother's ideas, because the reports are mainly completed by children mothers [36]. Thirdly, the unsatisfied mother may become unable to perceive the child's needs. Therefore, at feeding times, she may use coercive feeding methods for reduction of the child's refusal to eat [15].

Thus, feeding training programs are consists of helping parents to structure the mealtime, decrease feeding problem and improve mother-child interaction [37]. As a result, the feeding behavior improves mother-child interaction. Interventions aims at increasing

parent sensitivity (less furiousness when child cries while eating) may also have the reducing effect on disruptive behaviors (such as crying in mealtime) [38].

The present study shows that training program for parents resulted in improving feeding behaviors and reducing tension while eating. Behaviors that interfere with feeding, such as pushing the spoon away, crying, turning the head away, and nagging can be treated by mild punishment in the form of a brief time-out. For example, mother may withdraw the food and don't let child to eat. This procedure institutes a time period when the child is receiving no nutrition and no social reinforcement and theoretically constitutes a time-out from positive reinforcements. Parents can use high chair for time-out, it is practical requirement but they should ensure that the child cannot leave the area and access positive reinforcement [16]. When parents use high chair, their child is actually being negatively reinforced for food refusal. But when parents withdraw the food, children are reinforced positively. Although the child may initially receive some reinforcement through withdraw of the food, but his or her increasing hunger will soon make loss of access to the possibility of eating in aversive situation. Also, it is believed that using differential attention may improve child eating behavior. For example, one may pay positive attention to child and simultaneously ignore child's inappropriate reactions. Casey and et al think that ignoring by the use of extinguishing inappropriate behavior would improve child's behavior if accompanied by positive reinforcement [14].

The present study reveals that training program for parents in children's feeding problems results in the increase in eating different kinds of food. Differential attention (positive reinforcement for appropriate specific eating behavior and ignoring refusal and other inappropriate behavior) is a common component of effective treatment package for a variety of feeding problems, across diverse settings (home, inpatients, out patients, residential and non-residential school) [16]. One may use preferred

food as positive reinforcement to stimulate child does not like to eat [13]. In addition, previous studies have shown that amount or rate of eating is often influenced by negative reinforcement [22].

Contingencies are used until children exhibit a desired behavior (e.g., raising the spoon to their lips, opening their mouth and taking food off the spoon, chewing and swallowing) then positive reinforcements are immediately provided. For the child whose problems are variety, delivery of a small bite of preferred food contingent on acceptance of a non-preferred food is commonly suggested [23,36].

Initially, a reinforcement ratio of one bite of non-preferred food to one bite of preferred food is used. As treatment progresses, this ratio is gradually rises, requiring the child to take several bites of non-preferred food to obtain the preferred food reinforcement. During treatment, foods that are initially non-preferred often become preferred and can be used as reinforces.

Positive reinforcement is not effective for increasing some children's eating solely and when escape extinction was added to this technique, consumption increased for some participants [32].

However, it should be noted techniques based on positive reinforcement are not solely enough for decreasing feeding problems and increasing food acceptance. It seems that escape extinction is an important factor in treating food refusal because food refusal endures with negative reinforcement. According to conditional learning principle, if a food is given to a child against his/ her hatred and child's refusal behavior is extinguished, the probability of food acceptance by child increases [13]. In other words, using negative reinforcement, child leaves dining Table only if s/he eats considered food.

It should be noted some researchers believe, in first weeks when punitive principles are performed on child's inappropriate behaviors, child tries to resist against such behaviors. Therefore, child's stressful behaviors such as

aggressiveness increase, but when extinction and positive care are gradually used, the intensification of stressful behaviors decrease [39].

### Conclusion

These findings unveil the functional role of parent training in children's feeding improvements and extend the existing literature by demonstrating the functional impact of parent training on mother-child feeding interactions.

Despite shortcomings and unanswered questions raised by this research, the findings extend the existing literature by demonstrating the functional impact of parent training on mother-child feeding interactions. Feeding is an integral part of everyday family interactions, and this research suggests that training feeding problem may improve family relationships.

With regard to the current investigation, several limitations exist. Firstly, it is difficult for parents to place their child temporarily in a distressed state (like appetite manipulation), even if the outcome is positive. Secondly, the efficacy of each technique is not evaluated separately.

Future research should study the relationship between child and mother psychological characteristics (e.g. anxiety, depression and mother's obsession) and feeding problems and it should investigate the effects of such characteristics on intervention process. Also, it is proposed that to investigate closely the different components of mothers' training packages on reducing children's feeding problems, mother's satisfaction and treatment effects are evaluated every session. Documenting the results of behavioral procedures to more research on treatment efficiency and attention to the practical problems of implementing these programs are necessary.

Also, it should be noted that fathers' behavior are important in child feeding problem. Pressuring children to eat is a common feeding strategy adopted by fathers. Some differences were noted in mothers' and fathers' feeding practices; fathers were generally less likely to monitor

children's food intake and to limit access to food compared with mothers. Future research needs to be performed on different samples of fathers and train them about children feeding behavior.

### Acknowledgements

The author would like to thank the medical group of Behbood hospital for data collection supporting of this research.

### Contribution

Study design and analysis: NA

Data collection: NA

Manuscript preparation: NA, ZN

### Conflict of Interest

"The authors declare that they have no competing interests."

### Funding

The author (s) received no financial support for the research, authorship and/or publication of this article.

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