

# PROBLEMATIC EATING BEHAVIOUR IN TURKISH CHILDREN AGED 12–72 MONTHS: CHARACTERISTICS OF MOTHERS AND CHILDREN

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## SUMMARY

**Objective:** The aim of this study was to determine prevalence of problematic eating behaviour (PEB), associated risk factors, feeding practices including place of meal, variety of diet, and habits of consuming junk food, the mothers' perception of the child growth status in comparison to his/her peers, and the effects on anthropometric measurements.

**Methods:** This study was carried out among children aged 12–72 months who attended the outpatient clinic in the Ihsan Dogramacı Children's Hospital between February–June 2007. Three hundred and thirty-one mothers of children were asked to complete an extensive questionnaire covering socio-demographic characteristics and their child's general eating behaviour and feeding practices at mealtimes. Children with PEB were identified based on their mothers' statements.

**Results:** Three hundred and thirty-one cases were 3.32±1.39 years old. One hundred thirty-five mothers reported having a child with PEB. The mothers described the children's problematic behaviour as: need to walk around with the child during mealtime (45.6%), watching TV during meals (41.9%), picky or fussy eating (39%), vomiting and/or retching (25.7%), retaining food in the mouth for a long time (20.6%), and not eating solid foods (11.8%). In children who had ate neither meat nor vegetables and fruits, took cod-liver oil-containing supplement during the course of the study, and had taken iron supplements in the first year of life, PEB was more frequent than in others. The mean z scores of weight for age (WAZ) were significantly lower in cases with PEB than without PEB.

**Discussion:** Counselling and supporting of the mother/caregiver could alleviate the effect of inappropriate solutions taken by families. Insistence on composing of the diet variety including especially vegetables, fruits and meat may be promoted by provision of alternative cooking/presentation samples to mothers of children who refuse some foods. Pediatricians should be alerted that lower WAZ values may be a warning indicating a problem which may cause stagnated growth in children with PEB.

**Key words:** eating problems, children, weight for age, multivitamin, mineral, micronutrient, cod-liver oil supplements

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## INTRODUCTION

Problematic eating behaviour (PEB) among children is a frequent cause of parental concern. Particularly, eating a decreased variety of foods (picky or fussy eating) and avoiding unfamiliar foods (food neophobia, a fear of trying new things) are major sources of mealtime distress and a common complaint in well-baby clinics. The child's medical background, temperament, development, and experience may contribute individually and/or in combination with factors related to the caregiver(s) and the environment resulting in disturbances of normal feeding/eating behaviour (1). Thus, broadly defined eating problems are relatively common. The feeding/eating problems are especially related to age with typical onset between the ages of 6 months and 4 years.

“Feeding disorder” is a formal diagnostic term used in the main current diagnostic systems of the Diagnostic and Statistical Manual of Mental Disorders IV–Text Revision (DSM–IV–TR)

(2). Diagnostic criteria specify persistent (at least 1 month in duration) failure to eat adequately associated with weight loss or significant failure to gain weight, that is not directly due to a medical condition or another mental disorder, with onset before 6 years of age. However, many children with significant feeding problems may gain weight or fail to have a medical or mental health disorder ruled out, excluding them from this category. Williams et al. found that of 234 children referred to a feeding programme, only 19 met DSM–IV–TR criteria for feeding disorder (3).

Understanding children's attitudes and problems associated with eating is important with regard to child health because eating problems result in a significant weight loss and failure to thrive (4–6) and can negatively impact on mother–child interaction (7). Knowledge about the mothers' experiences of feeding situations and their different attitudes toward the child during feeding might help clinician understand and more adequately support mothers who experience feeding difficulties with their child. The aim of this study was to determine the prevalence of PEB as reported by

the mothers, associated risk factors, feeding practices including place of meal, variety of diet, and habits of consuming junk food, mothers' perception of the child growth status in comparison to his/her peers, and their understanding of how it may interfere with anthropometric measurements in children aged 12–72 months.

## METHODS

### Population

Between February–June 2007, this study was conducted among children aged 12–72 months who visited the outpatient clinic in the Ihsan Dogramacı Children's Hospital. Four hundred and thirteen mothers of children aged 12–72 months were interviewed for the current study. Eighty-two children who have a chronic medical or mental illness causing failure to thrive and delayed development were excluded from the study. The study was conducted according to the Helsinki II Declaration (World Medical Association 2004) and the mothers were included after their oral and written informed consent had been obtained.

### Eating Status Assessment

All mothers were asked to complete an extensive questionnaire with items concerning socio-demographic characteristics, gestational age, breastfeeding duration, starting age of complementary feeding, use of bottle and pacifier, daycare attendance, their child's eating behaviour and feeding practices including place of meal, selected foods, variety of diet, habits of consuming junk food, and taking multivitamin-mineral-micronutrient-cod liver oil supplements. The children with PEB were identified based on their mother's perception (Question: Are you satisfied with your child's eating status?). The question "Which of the following food items does your child usually accept to eat?" was constituted of a number of food items grouped into seven main groups as grains, legumes, meats, vegetables, fruits, cow's milk and dairy products, and egg. Major foods were grouped by category in accordance with the American Academy of Pediatrics Guidelines for Practitioners that were presented by the American Heart Association: 'Dietary Recommendations for Children and Adolescents' (8).

Mothers were asked to describe their experiences with respect to any PEB they experienced with their child at mealtime. Mothers' perception about the growth of their child was noted: "Could you define the growth status of your child with respect to his/her peers as failure to thrive, adequate, or overweight?". Junk food was defined as a highly caloric food with low nutritional value such as chips, gumdrop, candies etc.

### Anthropometric Measurements

The weight measurements of all the children were taken from the case record file but those of only 307 children were available. WHO Anthro Program (Version 3, April 2009) was used to calculate the z scores of weight (9).

### Statistical Analysis

Data were analyzed using the SPSS Windows 17.0 (SPSS Inc, Chicago, IL, USA). Descriptive statistics were used to present the population characteristics. Chi-square test was used for comparison of groups. Distribution of data was checked by the Kolmogorov-Smirnov normality test. The independent t-test was used to compare continuous variables (anthropometric measurements, breastfeeding duration, starting age of complementary feeding). Statistical significance was accepted as values of  $p < 0.05$ .

### Results

All 331 children ranged in age from 1 to 6 years, with a mean age of 3.32 (SD=1.39) years. Twenty-three percent (n=76) of the children were aged 12–24 months, 43.5% (n=144) were 25–48 months old, and 33.5% (n=111) were 49–72 months old. Forty-nine percent (n=163) of the children were girls.

In the present sample, 135 out of 331 children (40.8%) were reported by their mothers as having PEB. 30.3% of the children aged 12–24 months, 43.1% of the children aged 25–48 months, and 45% of the children aged 49–72 months had PEB according to their mothers (Table 1). The mean age of initiation of the PEB ( $\pm$ SD) was  $8.0 \pm 9.7$  (min–max: 0–36) months.

Mothers identified the following PEBs: need to walk around with the child during mealtime (45.6%), watching TV during

**Table 1.** Type of eating problems as reported by mothers, n (%)\*

	Age			Total
	12–24 months	25–48 months	49–72 months	
Status of at least one eating problem	23 (30.3)	62 (43.1)	50 (45.0)	135 (40.8)
<i>Distribution of the children with eating problems**</i>				
Walking around at mealtime	9 (39.1)	34 (51.6)	19 (38.0)	62 (45.6)
Eating while watching TV	10 (43.4)	28 (45.2)	19 (38.0)	57 (41.9)
Picky or fussy eating	8 (34.8)	24 (38.7)	21 (42.0)	53 (39.0)
Vomiting and/or retching while eating/feeding	7 (30.4)	11 (17.7)	17 (34.0)	35 (25.7)
Retaining food in the mouth for a long time	3 (13.0)	17 (27.4)	8 (16.0)	28 (20.6)
Not eating some solid foods	4 (17.4)	6 (9.7)	6 (12.0)	16 (11.8)
Total	76	144	111	331

\*percent of column, \*\*a child might have more than one eating problem

meals (41.9%), picky or fussy eating (39%), vomiting and/or retching while eating/feeding (25.7%), retaining food in the mouth for a long time (20.6%), and not eating solid foods (11.8%) (Table 1). The most common problem in children aged 12–24 months was eating while watching TV, walking around with the child during mealtime in children aged 25–48 months, and picky or fussy eating in children aged 49–72 months.

Ninety-eight percent of the mothers reported that their children consumed at least one type of food from the grain group, 86.4% consumed at least one type from the legumes group, 89.4% from milk and dairy products, 84% from meat (red and white), 73.7% from vegetables, and 86.7% from fruits. 14% of the mothers reported that their children did not eat egg. The frequency of PEB was significantly lower in children who ate at least one item from each group: the meat, vegetable or fruit group contrary to children who did not (for meat 37.4% (104/278) vs. 58.5% (31/53)  $p=0.004$ ; for vegetables, 34.4% (84/244) vs. 58.6% (51/87)  $p=0.001$ ; for fruits, 37.6% (108/287) vs. 61.4% (27/44)  $p=0.003$ , respectively). In our sample, 78% (258/331) of the mothers stated that their children had the habit of consuming some junk food. However, children who consumed junk food had higher percentages of PEB (43.4% vs. 31.5%) nevertheless the difference was not statistically significant ( $p=0.068$ ).

Gender, gestational age, use of a pacifier and bottle, and day-care attendance were not found to be associated with PEB (Table 2). The mean duration of breastfeeding was  $15.1\pm 7.3$  months and 71.2% children were breastfed for more than 12 months. The mean duration of breastfeeding and the mean starting age for complementary feeding were similar in cases with PEB and without PEB (for breastfeeding duration  $15.8\pm 7.9$  vs.  $15.0\pm 6.9$  months  $p=0.753$ ; initiation of complementary feeding  $5.8\pm 1.4$  vs.  $5.6\pm 1.5$  months  $p=0.159$ , respectively). The mean age of the first teething in PEB cases was not different from cases without PEB ( $7.3\pm 2.2$  month,  $7.8\pm 2.6$  months  $p=0.126$ , respectively).

The consumption of multivitamin, iron, zinc, and cod-liver oil supplements among children were noted in 19.6% (65/331), 6.0% (20/331), 5.7% (19/331), and 11.2% (37/331), respectively. PEB was detected more frequently in children who were served iron supplements than those who were not (45.3% vs. 32.5%  $p=0.022$ ). Children who were given cod-liver oil supplement had also more frequently PEB than others (59.5% vs. 38.4%  $p=0.014$ , respectively). However, there was no difference in intake of multivitamin and zinc supplements between groups (Table 2).

Approximately 52% of the mothers were housewives. Thirty-two percent of mothers and 23% of fathers were educated less than 8 years. Forty-two percent of the participating families had only one child, 45.9% had two children and 12% had three children. The frequency of PEB did not change with maternal education level, working status, smoking habits (Table 2).

Children whose mother reported them as failing to thrive had more frequently PEB than children whose growth was adequate or overweight (64% vs. 38% vs. 23%  $p=0.001$ , respectively).

A total of 11 (3.6%) children were undernourished or malnourished (weight for age z score  $< -2$ ). Only five (45.5%) of children were from PEB group. The mean WAZ was significantly lower in children with PEB than in those without PEB (WAZ:  $-0.02\pm 1.10$  and  $0.44\pm 1.21$ ,  $p<0.001$ ) However, the means of birth weight were not different between both groups (in children with PEB:  $3184\pm 0.566$  g vs. in children without PEB:  $3218\pm 0.522$  g,  $p>0.05$ ).

## DISCUSSION

Approximately 25–45% of normally developing children and up to 80% of developmentally delayed children experienced some type of feeding problem as reported by parents, with clinically diagnosed feeding disorders ranging from 1–2% (10). In our study, the rate of PEB as reported by mothers was consistent with previous studies in the literature.

Unhealthy diets and physical inactivity are the key risk factors for major chronic diseases such as cardiovascular diseases, cancer and diabetes. Overall, 2.7 million deaths are attributable

**Table 2.** The frequency of PEB according to some child and maternal characteristics, n (%)\*

		n/N	%	p
Gender	Girl	64/163	39.3	0.065
	Boy	71/168	42.3	
Age	12–24 monts	23/76	30.0	0.099
	25–48 monts	62/144	43.1	
	49–72 monts	50/111	45.0	
Gestational age	≤37 weeks	18/50	36.0	0.455
	>37 weeks	117/281	41.6	
Birth order of the present children	1	62/139	44.6	0.466
	2	57/152	37.5	
	≥ 3	16/40	40.0	
Breastfeeding duration	< 6 monts	25/53	47.2	0.493
	6–11.9 monts	63/165	38.2	
	>12 monts	37/88	42.0	
Starting age of complementary feeding	< 4 monts	6/17	35.3	0.614
	4–6 monts	92/240	38.3	
	≥ 7 monts	18/39	46.2	
Iron supplement intake, 1st year	Yes	92/203	45.3	0.022
	No	40/123	32.5	
Cod-liver supplements	Yes	22/37	59.5	0.014
	No	113/294	38.4	
Pacifier use	Yes	53/137	38.7	0.782
	No	81/193	42.0	
Bottle use	Yes	81/213	38.0	0.177
	No	53/116	45.7	
Day-care attendance	Yes	40/93	43.0	0.597
	No	94/236	39.8	
Mother's working status	Housewife	69/172	40.1	0.813
	Employed	65/157	41.4	
Maternal education, completed	Primary school	43/107	40.2	0.411
	Secondary school	43/93	46.2	
	University	49/131	37.4	
Maternal smoking during study period	Yes	33/76	43.4	0.544
	No	100/253	39.5	

\*percent of row

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to low fruit and vegetable intake (11). However, unhealthy food preferences might be associated with PEB in the early childhood period. The children who ate at least one item from each group – the meat, vegetable and fruit group had significantly lower risk for PEB. Carruth et al. found that picky eaters aged 24–36 months had lower dietary variety and diversity scores than non-picky eaters (12). A recent study of 3–5 year olds found that picky eating was associated with consumption of vegetables, particularly in boys (13). Cashdan reported that when parents were asked to list foods that their child refused to eat, nearly half indicated vegetables (14). Similar to our study, Cooke et al. reported that higher levels of neophobia were associated with lower consumption of vegetables, fruit and meat, but were unrelated to consumption of sweet, fatty snack foods, starchy staples, or eggs (15).

Eating habits formed in the first 1–2 years of life distinctly affect child development during subsequent years. Feeding difficulties frequently result from excessive parental insistence on eating and the subsequent anxiety of both the parents and the child if the child fails to heed the insistence (16). The mealtime strategies of the mothers to control their child with PEB varied in this study. About half of the mothers of children with PEB noted that they could only feed their children while walking around the house and most of the mothers stated that they could feed their children (in all age groups, particularly 25–48 months) in front of the television only. These results reflect inappropriate solutions taken by families in an effort to persuade their children with PEB to eat. In PEB group, 25.7% of the mothers told that their children were vomiting and/or retching during eating/feeding. Some mothers have admitted frequent insistence on eating during meals, the others stated that this problem occur spontaneously. Especially vomiting and retching which may stem up from organic causes such as gastro-oesophageal reflux, food allergy and swallowing disorders may even get worse with coercive attitudes of the mother (17). Eating no solid foods was another concern for mothers. Some researchers found a significant relationship between delayed introduction of lumpy foods and long term feeding problems in their prospective studies (18, 19). In this study, comparisons were not done due to low number of cases.

The frequency of PEB was higher in children using a cod-liver supplement than others. If mothers think that their child usual diet is inadequate with respect to quality and amount, they are more predisposed to give the child a nutritional supplement, which is easier, ready as an alternative medicine (20). Junk food consumption especially before mealtime may cause a loss of appetite due to the high fat and sugar content of the food. However, in the present study, there was no significant relationship between the reported PEB and consumption of junk food.

No relation was determined between breastfed or formula-fed infants and the presence of PEB in our study. However, a diversity of flavours and odors present in the maternal diet are transferred in the breast milk, whereas the variety of sensory cues in infant formula is limited. The flavours of maternal diet that are present in breast milk can facilitate acceptance of solid food in breastfed infants (21). This might be due to the limited number of infants taking formula. Indeed, 95.8% of infants had taken breast milk. Breastfeeding duration was not related to PEB in our study. Similarly, Burnier et al. suggested that three or more months of exclusive breastfeeding is a predictive factor for vegetable consumption, but their findings did not suggest a linear asso-

ciation between exclusive breastfeeding duration and vegetable consumption in preschool children (22). Fisher et al. reported that mothers who breastfed their infants for at least 12 months used lower levels of control in feeding, which was associated with higher toddler's energy intakes (23). They concluded that breastfeeding through the first year appears to support toddler's energy intake and growth by fostering a shared mother-infant regulation of toddler's food intake.

There was no association between the parental educational status and existence of PEB in children. A few studies have further investigated the social determinants of dietary patterns or parental feeding practices. One group of researchers has reported an association between the mother's educational level and PEB as overeating (24). Evans et al. found no significant differences in parental feeding practices using the Preschooler Feeding Questionnaire according to education level (25). Maternal employment status and the number of children and history of a child death in the family were also found not to be related to PEB.

Feeding problems result in significant weight loss, inadequate growth, and micronutrient deficiency and can have a negative influence on child development. In our study, PEB were found to be associated with WAZ, but anthropometric assessment of the children was incomplete because the measurement of height was missing.

This finding is consistent with previously published studies (4–6). However, under-nutrition indicators were influenced differently by nutritional status; for example, Sanchez et al. found that children aged 0–2 years with eating behaviour disorders presented with lower birth weight, weight for length, and length for age z scores (5). Wright and Birks suggested that undemanding behaviour, low appetite and poor feeding skills may contribute to onset and persistence of failure to thrive (26). On the other hand, in a longitudinal study, picky eaters were twice as likely to be underweight at 4.5 years as children who were never picky eaters (24).

Our study has some limitations. First, in this study, the prevalence of PEB was based on the mothers' subjective opinion of their child's attitudes, but we concluded that their self-reports were generally consistent with the obtained anthropometric measurements, with a few exceptions. Although eating behaviour in children has also been linked to different factors such as mother/caregiver – child interaction, the child's temperament, parental practices regarding feeding, parental eating habits, and family culture, etc., these were not included in this study. Second, this study was conducted in a small convenience sample. Third, a simple questionnaire method, in which mothers were queried regarding the consumption of items in the major food groups, was administered to parents to estimate dietary intake.

## CONCLUSION

This study shows that PEBs are commonly seen in children aged 12–72 months. Pediatricians should evaluate PEBs routinely during check-up visits. With provision of appropriate counselling to mothers during and after the weaning period, healthy/good eating habits and behaviour may be fostered in growing children. This counselling should include sitting at the table, turning off the television, interacting socially during mealtime, promoting a

child's ability to self-regulate his/her food intake, offering a wide variety of foods and, providing appropriate portion sizes and frequency of meals for children (27, 28). More attention should be paid to children with problematic eating attitudes in view of the possible detrimental effects on child's growth.

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#### Conflict of interests

None declared

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