

A Study on Behavioral Pediatric Feeding Status: Maternal Opinions

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Summary. *Aim:* This research aimed to examine behavioral feeding status in children aged 6-8 according to maternal opinions. The research investigated if *Behavioral Pediatrics Feeding Assessment Scale (BPFAS)* overall score differed significantly by family structure, mother's history of nutrition education and child's history of health problems and medication use. *Materials and methods:* The population was Kocaeli province, while the sample comprised 245 children and their mothers selected with convenience sampling from primary schools in Kocaeli Turkey. *Data analysis:* The study data were gathered with a questionnaire form and the *Behavioral Pediatrics Feeding Assessment Scale*. Mann Whitney U tests were conducted to investigate if *BPFAS* subscale scores differed by mother's history of nutrition education, and if *BPFAS* overall score differed by family structure, mother's history of nutrition education and child's history of health problems and medication use. Differences in *BPFAS* overall score by child's Body Mass Index (BMI), age group and parents' educational attainment were analyzed with Kruskal Wallis H tests. *Results and discussion:* 54.3% of the children participating in the study were female, while the percentages of the children aged 6, 7 and 8 were 21.2%, 28.6% and 50.2%, respectively. 64.5% of the children were underweight and 4.1% were overweight according to their BMI. Mean maternal and paternal ages were 35.4 ± 1.1 and 39.6 ± 1.1 years, respectively. In the study, a standard deviation greater than two was indicative of pediatric feeding behaviors. The majority of the children's BMI was below 18.5, suggesting an inadequate and unbalanced nutritional behavior, which can be considered an indicator of incipient malnutrition. *Conclusions and suggestions:* the researchers recommend popularizing *nutrition education* in schools as a government policy to combat childhood underweight and malnutrition.

Key words: Feedings disorder, food refusal, feeding problems

Introduction

Feeding disorders in children lead to growth retardation and malnutrition (1). Inappetence is a pediatric feeding disorder that is characterized as decreased appetite and unwillingness to consume food, and poor appetite in children is used to refer to various behavior characteristics such as fussiness, pickiness, reluctance to eating or difficulty in feeding (2). Pediatric feeding

disorders are a prevalent condition that is encountered in 25-40% of healthy children and as high as 80% of children with growth retardation (3). Eating problems in preterm children encompass organic feeding disorders like nausea and vomiting, chewing problems and a cleft lip/palate (4), whereas behavioral feeding disorders involve factors such as the child, the parents and the environment (5,6). Pediatric feeding disorders are classified as pickiness, general food refusal in toddlers,

textured food refusal in toddlers and general food refusal in older children (7). Family size was found to affect appetite, where inappetence was observed less frequently among children from larger families as the meal was eaten in a more crowded environment (8). According to (9), the number of children with poor appetite decreases with the number of children in the household. Mothers practice healthier nutritional habits for their children as maternal educational attainment increases, and mothers of picky children were found to be thinner, younger and having lower educational attainment (6,10,11). Children regarded as poor eaters were reported to prefer eating snacks and starchy and sweet foods instead of warm meals (12,13).

The identification of the risks regarding behavioral feeding disorders in children, a contemporary issue of gradually increasing significance, is critical to mitigating the development of feeding disorders in later years. In this context, this study aimed to investigate behavioral feeding status in children aged 6-8 according to maternal opinions. The study sought to answer the following questions:

1. Is there a significant difference in *BPFAS* overall score by mother's history of nutrition education?
2. Is there a significant difference in *BPFAS* overall score by child's history of pediatric feeding disorders?
3. Is there a significant difference in *BPFAS* overall score by child's history of medication use?
4. Is there a significant difference in *BPFAS* subscale scores by mother's history of nutritional education?
5. Is there a significant difference in *BPFAS* overall score by child's Body Mass Index?
6. Is there a significant difference in *BPFAS* overall score by child's age?
7. Is there a significant difference in *BPFAS* overall score by parents' educational attainment?

Materials and Methods

Research Design

This study adopted the screening survey design, which aims to characterize a past or current condition as is (14).

Population and Sample

The research population comprised 12971 students aged 6-8 attending public schools in Gebze, Kocaeli in the 2018-2019 academic year, while 245 children and their mothers selected by convenience sampling from among 565 6-8-year-old children in the study population with a confidence interval of 95% and an error margin of 0.05 constituted the study sample. Convenience sampling is conducted on proximate, accessible and available volunteers in the lack of a specific designated area (15). Frequencies and percentages for demographic information regarding the children and their parents are given in Table 1.

Table 1. Frequencies and percentages for demographic information on the children and their parents (n=245)

Variables	Category	n	%
Child's gender	Female	133	54.3
	Male	112	45.7
Age	6	52	21.2
	7	70	28.6
	8	123	50.2
Does the child have a pediatric feeding problem?			
Yes	Cleft lip/palate	5	2.0
	Swallowing	5	2.0
	Cardialgia	5	2.0
	Vomiting	6	2.4
	Chewing	6	2.4
	Abdominal pain	6	2.4
	No	212	86.5
Family structure	Nuclear family	176	71.8
	Extended family	69	28.2
Mother's education	Literate	15	6.1
	Primary school	114	46.5
	Middle school	54	22.0
	High school	43	25.3
	University	19	7.8
Father's education	Literate	6	2.4
	Primary school	65	26.5
	Middle school	64	26.1
	High school	82	44.9
	University	28	11.4
Mother's nutritional education	Attended	32	13.00
	Did not attend	213	87.00

Table 1 shows that 54.3% of the children were female, while 21.2% and 50.2% of the children were aged 6 and 8, respectively. The problems reported for the children were cleft lip/palate 2.0%, swallowing 2.0%, cardialgia 2.0%, vomiting 2.4%, chewing 2.4% and abdominal pain 2.4%. 28.2% of the families were extended and 71.8% were nuclear families. 46.5%, 7.8% and 6.1% of the mothers were primary school graduates, university graduates and literate, respectively, while the percentages of the fathers who were high school graduates, university graduates and literate were 44.9%, 11.4% and 2.4%, respectively. Furthermore, maternal mean age was $\bar{X} = 35.4754$ and paternal mean age was $\bar{X} = 39.672$ for the participants.

Data Collection Instrument

The study data were gathered with the *Child and Parent Demographic Information Form* and the *Behavioral Pediatrics Feeding Assessment Scale (BPFAS)* adapted into Turkish by (7).

The *Child and Parent Demographic Information Form* encompassed 6 questions on the child's gender and age, whether the child had a feeding problem, family structure, maternal and paternal education and whether the mother had attended nutrition education.

The items in the *Behavioral Pediatrics Feeding Assessment Scale* are rated between 1 and 5: 1=Never, 2=Rarely, 3=Sometimes, 4=Frequently, 5=Always. Scale score ranges between 35 and 175. Higher overall scores indicate greater feeding disorders and more problematic nutritional habits. The *BPFAS* has 6 positively (1, 3, 5, 6, 9 and 16) and 19 negatively phrased items and positive items are reverse scored. The *BPFAS* comprises four subscales: *Picky Eaters* (7), *Toddler Refusal - General* (5), *Toddler Refusal - Textured Foods* (5) and *Older Children Refusal - General* (7).

Data Collection

After the acquisition of official permission from the Ministry of National Education, the administrators and classroom teachers in respective schools were informed by the researchers. Both the *Child and Parent Demographic Information Form* and the *Behavioral Pediatrics Feeding Assessment Scale* were handed to the

children by the teachers to be delivered to the parents and recovered in the same manner.

Data Analysis

Data gathered from the mothers in accordance with the aim of the study were processed via a software package for social sciences. Mann Whitney U tests were conducted to investigate the existence of a difference in the child's *BPFAS* overall score by whether the mother had/had not attended nutrition education, whether the child had/had not a feeding disorder and whether the child was/was not on any medication, as well as, in the child's *BPFAS* subscale scores by whether the mother had/had not attended nutrition education. In addition, differences in *BPFAS* overall score by the child's Body Mass Index (BMI), age group and parents' educational attainment were analyzed with Kruskal Wallis H tests.

Results

The results of the study aimed at investigating behavioral pediatric feeding status in children according to maternal opinions were given in Table 2-4.

In Table 2, the child's *BPFAS* overall score was analyzed with respect to different variables for the child and the mother. The mean score of the mothers who had attended nutrition education (=141.31) were higher than those who did not have a history of nutrition education (=120.25). There was no statistically significant difference between groups by whether or not the mother had attended nutrition education ($p > 0.05$). The children with feeding disorders (=153.89) scored higher than the children who did not have feeding disorders (=118.19). The results revealed a statistically significant difference in *BPFAS* overall score by whether or not the child had a feeding disorder ($U = 2.695$, $p < 0.05$). The children who were on medication (=159.87) scored higher than the children who were not medicated (=119.34). There was a statistically significant difference in *BPFAS* overall score by child's medication use ($p < 0.05$).

In Table 3, the child's *BPFAS* subscale scores were examined with respect to mother's nutrition

Table 2. Mann Whitney U test results: *BPFAS* overall score by different variables for the child and the mother

Overall Score/Different Variables	Category	<i>n</i>	Mean Rank	Rank Sum	<i>U</i>	<i>p</i>
Has the mother attended nutrition education?	Yes	32	141.31	4522.00	1.569	.117
	No	213	120.25	2561.00		
Does the child have a feeding problem?	Yes	33	153.89	5078.50	2.695	.007*
	No	212	118.19	2507.50		
Is the child on any medication?	Yes	19	159.87	3037.50	2.405	.016*
	No	225	119.34	2685.50		

$p > 0.05$, $p < 0.05^*$

Table 3. Mann Whitney U test results: *BPFAS* subscale scores by mother's nutrition education

Subscale	Nutrition Education	<i>n</i>	Mean Rank	Rank Sum	<i>U</i>	<i>p</i>
<i>Picky eaters</i>	Yes	32	115.03	3681.00	3.15	.493
	No	213	124.20	26454.00		
<i>Toddler refusal—General</i>	Yes	32	141.11	4515.50		.119
	No	213	120.28	25619.50		
<i>Toddler refusal—Textured foods</i>	Yes	32	170.22	5447.00		.000*
	No	213	115.91	24688.00		
<i>Older children Refusal—General</i>	Yes	32	134.92	4317.50	.306	
	No	213	121.21	25817.50		

$p > 0.05$, $p < 0.05^*$

education history. Regarding the mothers of picky eaters, the mothers who had attended nutrition education (=115.03) scored lower than the mothers who had not (=124.20), whereas, for the mothers of toddlers who refused food in general, the mothers who had attended nutrition education (=141.11) scored higher than those who had not (=120.28). The results yielded no statistically significant difference between groups ($p > 0.05$). Regarding the mothers of toddlers who refused textured foods, the mothers who had attended nutrition education (=170.22) had a higher mean score than those who had not (=115.91). There was a statistically significant difference in *Toddler Food Refusal – Textured Foods* by mother's history of nutrition education ($p < 0.05$). Concerning the mothers of older children who refused food in general, the mothers who had attended nutrition education (=134.92) had a greater mean score than the mothers who had not (=121.21). There was no statistically significant difference between groups ($p > 0.05$).

In Table 4, *BPFAS* overall mean score and children's BMI were analyzed with a Kruskal Wallis H test. The mean score of underweight children (=120.30) was found to be lower, while the mean scores of normal (=126.53) and overweight (=138.45) children were higher. The results yielded no statistically significant difference in *BPFAS* overall mean score by BMI [$X^2(2)=.897$, $p > 0.05$].

Examination of *BPFAS* overall mean score with respect to children's age showed that the mean score of the 6-year-old children (=142.89) was higher than those of the 7-year-olds (=129.71) and 8-year-olds (=110.77). There was a statistically significant difference in *BPFAS* overall mean score by age [$X^2(2)=8.405$, $p < 0.05$].

BPFAS overall mean score was examined with respect to maternal and paternal education. The mean scores of literate (=142.37), primary school graduate (=127.31) and university graduate (=126.53) mothers were higher, while the mean score of the moth-

Table 4. Kruskal Wallis H test results: *BPFAS* overall score by different variables

Variable	Category	<i>n</i>	Mean Rank	χ^2	SD	<i>p</i>
BMI	1	158	120.30	.897	2	.638
	2	77	126.53			
	3	10	138.45			
Age	6	52	142.89	8.405	2	.015*
	7	70	129.71			
	8	123	110.77			
Mother's education	Literate	15	142.37	3.111	4	.539
	Primary school	114	127.31			
	Middle school	54	115.53			
	High school	43	112.65			
	University	19	126.53			
Father's education	Literate	6	152.33	3.856	4	.426
	Primary school	65	129.81			
	Middle school	64	116.61			
	High school	82	116.07			
	University	28	135.82			

BMI 1=17.00-18.49 Underweight, 2= 18.50-24.99 Normal, 3=25.00-29.99 Overweight

ers with a high school degree (=112.65) were lower. There was no statistically significant difference in *BPFAS* overall mean score by mother's educational attainment [$X^2(4)=3.111$, $p>0.05$]. Furthermore, the mean score of literate fathers (=152.33) was higher, while the mean scores of university, primary school, middle school and high school graduate fathers were =135.82, =129.81, = 116.61 and =116.07. The results yielded no statistically significant difference in *BPFAS* overall mean score by father's educational attainment [$X^2(4)=3.856$, $p>0.05$].

Discussion

This study was carried out to investigate behavioral pediatric feeding disorders according to maternal opinions. More than half of the children aged 6-8 were female. Very few of the children had cleft lip/palate, swallowing and cardialgia problems, while some suffered from abdominal pain, vomiting and chewing problems. The majority of the families were nuclear families. Maternal and paternal mean ages were 35.47

and 39.672, respectively. Most of the mothers were primary school graduates, university graduates and literate, in order of magnitude, while the majority of the fathers were high school and university graduates, with very few literate fathers.

BPFAS overall score was analyzed with respect to different variables for the child and the mother. The mothers who had attended nutrition education scored higher than those who had not, with no statistically significant difference ($p>0.05$). This might indicate a lack of consciousness among the mothers to translate their nutritional knowledge into behavior, even if they were knowledgeable about nutrition. The study by (16) reported that parents were able to better translate nutritional knowledge into behavior and act more consciously with increasing educational attainment. Another study by (17) recommended the provision of nutritional training to fathers and other caregivers alongside mothers to promote more favorable feeding behaviors and attitudes in children.

The children with pediatric feeding disorders such as cleft lip/palate, cardialgia, abdominal pain, vomiting and chewing problems scored significantly higher than

those with no pediatric feeding disorders ($p < 0.05$), which might be attributed to a lack of knowledge and awareness about feeding disorders among mothers of children with pediatric feeding disorders. The studies by (18,19,20) reported that organic causes like cleft lip/palate, cardialgia and abdominal pain exacerbated feeding disorders. Other studies by (21,22) related that pharyngoesophageal stenosis or anomalies caused difficulty in swallowing, leading to severe feeding disorders. The studies by (13, 23) reported the utilization of the escape extinction method in pediatric feeding disorders to hinder the child from avoiding eating. Another study mentioned that children held on to the spoon in their mouths until they ate all the food (24). Furthermore, Morris et al. (25) emphasized the complexity of pediatric feeding disorders and the need for multidisciplinary treatment. The study results also revealed a higher *BPFAS* overall score for children who were on medication than those who were not. There was a statistically significant difference in favor of the medicated children ($p < 0.05$). The mothers, caregivers or family elders of the medicated children might have acted more consciously due to health concerns. According to (26) highlighted the crucial importance of using medications timely and commensurately to avoid drug toxicity, especially in young children.

Although the mothers with a history of nutrition education scored lower in the *Picky Eaters* subscale of the *BPFAS* than the mothers with no history of nutrition education, the results showed no significant difference, which might stem from a lack of realization among the mothers as to their children's behavioral feeding disorders. The mothers who had attended nutrition education had a higher mean score, while those who had not attended nutrition education had a lower mean score in the *Toddler Refusal – General* subscale, with no statistically significant difference ($p > 0.05$). Nutritional consciousness of mothers with a history of nutrition education might have led to an authoritarian approach in feeding their children. Research suggests that explanations provided to 6-8-year-old children by parents regarding why certain foods are permitted and the reasons of food refusal facilitate feeding (27,28,29).

The mothers with a history of nutrition education scored higher in the *Toddler Refusal – Textured Foods* subscale of the *BPFAS* than the mothers with no his-

tory of nutrition education, with a statistically significant difference ($p < 0.05$). Mothers should be advised on behavioral pediatric feeding disorders to promote awareness and consciousness.

The mothers who had attended nutrition education had a higher mean score than those without any history of nutrition education in the *Older Children Refusal – General* subscale, with no statistically significant difference between groups ($p > 0.05$).

Analysis of *BPFAS* overall mean score with respect to the children's BMI yielded lower mean scores for underweight and normal children and a higher mean score for overweight children. There was no statistically significant difference in *BPFAS* overall mean score by BMI ($p > 0.05$), which could be interpreted as a lack of maternal awareness regarding their children being underweight or overweight according to their BMIs. The studies by (30,31,32) stressed a tendency for future obesity among children whose mothers allowed the consumption of any unhealthy food their children desired. Another study by (33) reported the favorable effect of healthy snacks and foods mothers consciously made for their children to prevent behavioral feeding disorders on children's daily energy intake. The *BPFAS* overall mean scores of the children in the 6- and 7-year-old age group were higher than that of the 8-year-olds with a statistically significant difference ($p < 0.05$), which can be attributed to the greater possibility of behavioral pediatric feeding disorders at a younger age. According (34) similarly emphasized the prevalence of feeding disorders in childhood. Other studies by (3, 6) reported feeding disorder diagnosis rates of 25-45% and 80% in healthy children and children with growth retardation, respectively.

BPFAS overall mean score was investigated with respect to maternal and paternal education. The results revealed that the mean scores of literate, primary school graduate and university graduate mothers were higher, while the mean score of the mothers with a high school degree were lower. There was no statistically significant difference in *BPFAS* overall mean score by mother's educational attainment ($p > 0.05$). In addition, the mean scores of literate, university graduate and primary school graduate fathers were higher, while those of middle school and high school graduate fathers were lower. There

was no statistically significant difference in *BPFAS* overall mean score by father's educational attainment ($p > 0.05$), which can be ascribed to a lack of awareness among the fathers regarding their children's behavioral feeding disorder. According to (6, 35,36) have cited maternal and paternal awareness on nutrition as the most important factor in transforming children's behavioral feeding disorder into favorable behaviors and outcomes.

Conclusion

The conclusion of the study conducted to investigate behavioral pediatric feeding status according to maternal opinions are as follows:

The children who suffered from organic feeding disorders such as cleft lip/palate, cardialgia, abdominal pain and chewing problems had higher scores than those with no feeding disorders, which can be attributed to a lack of awareness among the mothers about the nutritional behaviors of their children with a feeding disorder.

Another finding of the study was the statistically significant difference in *BPFAS* overall mean score in favor of the medicated children in comparison to non-medicated children ($p < 0.05$), which suggests more conscious efforts among the parents of the medicated children due to health concerns.

The mothers with a history of nutrition education scored higher in the *Toddler Refusal – Textured Foods* subscale of the *BPFAS* than the mothers with no history of nutrition education. The result revealed a statistically significant difference in the *Toddler Refusal – Textured Foods* subscale score by mother's nutrition education history ($p < 0.05$), which indicates the awareness of the mothers as to whether their children's food refusal is due to organic causes or feeding behavior.

BPFAS overall mean scores of the children in the 6- and 7-year-old age group were higher than that of the 8-year-olds with a statistically significant difference ($p < 0.05$), which can be attributed to the younger age of the children, as well as, a lack of adequate knowledge among the mothers concerning behavioral feeding disorders.

Suggestions

The cause of children's inappetence and eating disorders must be properly identified. As successful treatment of pediatric feeding disorders requires a multidisciplinary approach, a team collaboration must be ensured among pediatricians, psychologists, dietitians, speech therapists and social workers. Sustainable nutrition training must be provided to parents for pediatric feeding disorders, and efforts must be engaged to promote parental awareness on pediatric feeding disorders. In addition, training programs on healthy nutrition can be organized with the participation of students with leadership skills designated by the Ministry of National Education at every school, aiming to inform both students and their mothers via student-to-student and student-to-mother nutrition training with the support of nutritionists.

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Informed Consent

Informed consent was attended from all individual participant included in the research.

Conflict of Interest

All authors declare that they have no conflict of interest. The authors alone are responsible for the content, statistical analyses and writing of the article.

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