



Original

How does parents' visual perception of their child's weight status affect their feeding style?

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Abstract

Introduction: Eating style is one of the prominent factors that determine energy intake. One of the influencing factors that determine parental feeding style is parental perception of the weight status of the child.

Aim: The aim of this study is to evaluate the relationship between maternal visual perception of their children's weight status and their feeding style.

Method: A cross-sectional survey was completed with only mother's of 380 preschool children with age of 5 to 7 (6.14 years). Visual perception scores were measured with a sketch and maternal feeding style was measured with validated "Parental Feeding Style Questionnaire".

Results: The parental feeding dimensions "emotional feeding" and "encouragement to eat" subscale scores were low in overweight children according to visual perception classification. "Emotional feeding" and "permissive control" subscale scores were statistically different in children classified as correctly perceived and incorrectly low perceived group due to maternal misperception.

Conclusion: Various feeding styles were related to maternal visual perception. The best approach to preventing obesity and underweight may be to focus on achieving correct parental perception of the weight status of their children, thus improving parental skills and leading them to implement proper feeding styles.

(Nutr Hosp. 2013;28:741-746)

DOI:10.3305/nh.2013.28.3.6358

Key words: Children. Parental feeding styles. Maternal misperception. Visual perception. Misclassification. Weight status.

¿CÓMO AFECTA LA PERCEPCIÓN VISUAL DE LOS PADRES SOBRE EL ESTADO DE PESO DE SUS HIJOS EL ESTILO DE ALIMENTACIÓN?

Resumen

Introducción: El estilo de alimentación es uno de los factores prominentes que determina la ingesta de energía. Uno de los factores que influyen en el estilo de alimentación paterna es la percepción de los padres del estado de peso del niño.

Objetivo: El propósito de este estudio fue evaluar la relación entre la percepción visual de la madre del estado de peso de su hijo y su estilo de alimentación.

Método: Se realizó un estudio transversal con madres de 380 niños preescolares de 5 a 7 (6,14 años). Las puntuaciones de la percepción visual se midieron mediante unos dibujos y el estilo de alimentación materna se midió con el cuestionario validado "Parental Feeding Style Questionnaire".

Resultados: Las puntuaciones de las subescalas de las dimensiones de alimentación parental "alimentación emocional" y "animar a comer" eran bajas en niños con sobrepeso de acuerdo con la clasificación de la percepción visual. Las puntuaciones de las subescalas "alimentación emocional" y "control permisivo" eran estadísticamente distintas en los niños clasificados como correctamente percibidos e incorrectamente percibidos bajos por una mala percepción materna.

Conclusión: Diversos estilos de alimentación se relacionaban con la percepción visual materna. El mejor abordaje para evitar la obesidad y el peso bajo podría estar en centrarse en conseguir una correcta percepción parental del estado de peso de sus hijos, mejorando así las habilidades paternas y conllevando la implantación de unos estilos de alimentación adecuados.

(Nutr Hosp. 2013;28:741-746)

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Palabras clave: Niños. Estilos de alimentación paternos. Mala percepción materna. Percepción visual. Error de clasificación. Estado de peso.

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Recibido: 6-XII-2012.
1.ª Revisión: 18-XII-2012.
Aceptado: 8-I-2013.

Introduction

The prevalence rate of obesity in childhood is increasing conspicuously all over the world, including Turkey. Although obesity is prevalent among children of all ages, failure to thrive (FTT) is still observed at high rates in both developed and developing countries.¹ Both obesity and failure to thrive have become major public health problems around the globe.²⁻⁴ To achieve successful feeding, it is essential to set a correct and reliable interaction between parent and child.⁵ Environmental factors play an important role beyond genetic features. Eating style is one of the prominent factors that determine energy intake.⁶

The risk of obesity and FTT can be influenced by early life nutrition. In this period, the type and amount of food intake are completely linked to parental (mostly maternal) perceptions, behaviors, and decisions.^{7,8} One of the influencing factors that determine parental feeding style is parental perception of the nutritional status of the child.^{7,8}

The development of appetite continues over the preschool period.⁹ One of the most pressing problems in parenting is the child's appetite. Various factors, such as age, peer influence, and family eating habits, influence appetite, and parents worry if their child seems underweight or overweight. Mothers can give information about their child's appetite better than anyone else because they live together with and monitor their child over an extended period of time, involving different situations and different foods.⁹ A significant correlation was reported between appetite ratings and PFSQ subscales.^{9,10} Although parents, especially mothers, are a good source of information on their child's appetite, they are not always aware of their child's nutritional status.^{11,12}

Programs to treat or prevent childhood obesity or FTT unfortunately become unsuccessful when parents do not correctly perceive their child's weight. We hypothesized that when parents perceive their normal-weight child as too slim or skinny, they pressure their child to eat more, but when they perceive their overweight/obese child as normal, they continue to feed them with the usual types and amount of food, putting them at risk for extreme weight gain.

Thus, using a validated questionnaire and a scale, we aimed to reveal how parents' perception of their child's nutritional status affects parental feeding style.

Patients and methods

Design and subjects

In this prospective study, data were collected from a questionnaire conducted in 2008 at 16 elementary schools' preschool classes in Tokat, Turkey. This was a cross-sectional study of parents of children 5 to 7 years of age, using a self-administered questionnaire that assessed parental feeding style and some demographic data on the child and family.

Five hundred parents of preschool children participated in this questionnaire. After obtaining consent from the University Management and School District of Tokat city, all three parts of the survey and a consent form were sent to parents in an enclosed envelope that the children were asked to bring home. One week later, completed consent forms and surveys were collected by one of the researchers. A total of 447 parents returned the envelopes, 67 of which were excluded because of incomplete information. Power analysis revealed that the 16 schools and 380 parents had sufficient power to detect effective sizes.

Instruments and variables

The questionnaire had three sections and took approximately 15 to 20 minutes to fill in. In the first section, demographic information on the child (age, gender, weight, height, vitamin and iron supplementation, and medical conditions that affect the child's activity and feeding practices) and parents was gathered. The second section contained the Parental Feeding Style Questionnaire (PFSQ), a psychometrical tool for assessing four aspects of the feeding style of parents designed by Wardle et al.¹⁰ A study on the reliability and validity of the Turkish PFSQ has been published recently.¹³ The original PFSQ consisted of 27 items representing four scales (Instrumental [IF], Encouragement [EN], Control [C], and Emotional [EM]). In comparison, the validated Turkish version of the PFSQ had five subscales. The Control subscale was divided into two parts, 1-Strict Control [SC] and 2-Permissive Control [PC], for increased consistency of the questionnaire. The third section presented a series of sketches of children created by a graphic artist (Scott Millard) (figs. 1 and 2). The respondents were requested to circle the sketch (from among seven choices) that most resembled their child's body shape. For further analysis of visual weight perception, we correlated the seven sketches with three BMI percentile groups; the first two, the middle three, and the last two sketches were considered as underweight, normal, and overweight, respectively. Researchers evaluated the nutritional status of 380 children aged 5 to 7 years, employing body mass index (BMI) values as the diagnostic criterion. To determine BMI, the weight (kg)/height² formula was used. The nutritional statuses (NS) of children were classified according to the National Center for Health Statistics growth charts' BMI percentiles as underweight (UW) if below the 5th percentile, as overweight (OW) if above the 95th percentile, and as well-nourished (N) if between the 5th and 95th percentiles.¹⁴

Statistical analysis

Cramer's V coefficient was used to determine concordance between the parental visual perception

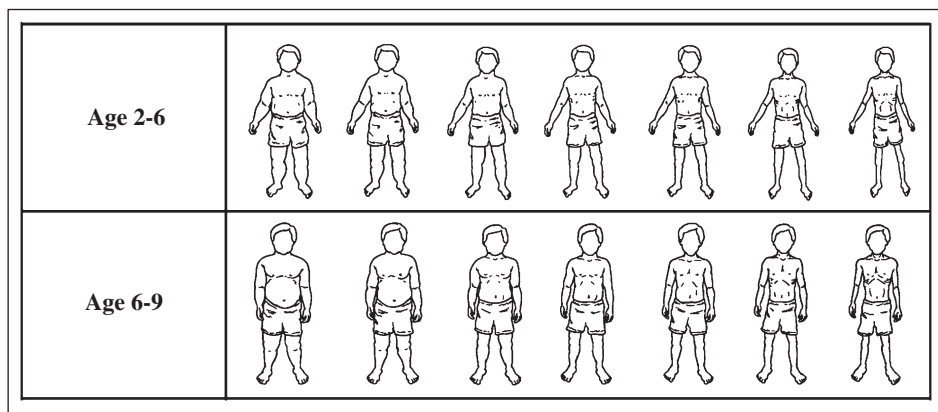


Fig. 1.—Age range specific sketches for boys. Sketches were used under permission of Scott Millard (©Scott Millard).

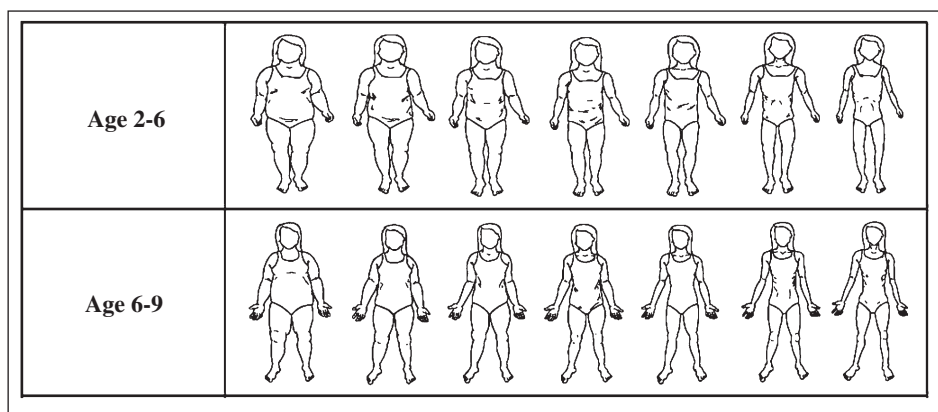


Fig. 2.—Age range specific sketches for girls. Sketches were used under permission of Scott Millard (©Scott Millard).

scores and children's NS. The Kolmogorov-Smirnov test was used to evaluate whether the distribution of the total scores on the PFSQ subscales was normal. One-way analysis of variance (ANOVA) and Kruskal-Wallis analysis of variance were used for comparison of the total scores on the PFSQ subscales among groups. The Mann-Whitney U test (with Bonferroni adjustment) and Scheffe test were used for multiple comparisons. The total scores on the PFSQ subscales were presented as mean \pm standard deviation, median, and interquartile range (IQR, Q1 to Q3). For evaluation of variables, if parametric assumptions were met, mean and standard were used, otherwise median and interquartile ranges were used. A p-value < 0.05 was considered significant. The analyses were performed using commercial software (IBM SPSS Statistics 19, SPSS Inc., an IBM Co., Somers, NY).

Results

The demographic characteristics of the children and their mothers are given in table I. The mean ages of the children and their mothers were 6.14 and 31.35 years, respectively. More than half (57.9%) of mothers recognized their child's nutritional status correctly. Mothers of normal-weight children were more likely to recognize their child as normal (81.4%), and mothers of under-

Age	5 years	42 (11.1)
	6 years	242 (63.7)
	7 years	96 (25.3)
Sex	Boys	194 (51.1)
	Girls	186 (48.9)
Nutritional Status	Underweight	54 (14.2)
	Normal	285 (75)
	Overweight	41 (10.8)
Mother	Age	31.35 \pm 4.61
	BMI	25.01 \pm 4.02

Data are shown as n (%) and mean \pm SD.

weight children were more likely than other groups to misrecognize their child's nutritional status (78%) ($p < 0.001$) (table II). Parental feeding styles are presented in table III. A significant correlation was found between NS and maternal visual perception (Cramer's V) (table II).

Overall, the subscale scores demonstrated comparatively high levels of EN (32 of 40) and SC (13 of 20), with lower levels of IF (9 of 20), EM (13 of 25), and PC (14 of 25) (table III). There is no normal or cut off value for PFSQ subscales and we used total subscale scores

Table II
Concordance, between visual perception scores and nutritional status

Visual perception scores of mothers	Nutritional status			Total	p
	Underweight	Normal	Overweight		
Underweight	31 (57.4)	107 (37.5)	3 (7.3)	141 (37.1)	< 0.001
Normal	22 (40.7)	166 (58.2)	16 (39.0)	204 (53.7)	
Overweight	1 (1.9)	12 (4.2)	22 (53.7)	35 (9.2)	
Total	54 (14.2)	285 (75.0)	41 (10.8)	380	

IF: Instrumental; EN: Encouragement; C: Control; EM: Emotional; SC: Strict Control; PC: Permissive Control [PC].
Data are shown as n (%), Cramer's V: 0.396, p < 0.001.

Table III
Correlation of PFSQ subscale scores and nutritional status of children

Overall subscale scores	Nutritional status			p	
	Underweight (n = 54)	Normal (n = 285)	Overweight (n = 41)		
EM	13.19 ± 4.22	13.89 ± 3.37	13.19 ± 4.43	12.32 ± 3.66	0.200
EN	31.18 ± 5.05	33 [28-35.25]	32 [28-35]	31 [27-33]	0.077
IF	9.56 ± 3.18	10 [8-12.25]	9 [7-12]	8 [7-10.5]	0.171
PC	13.59 ± 3.53	13 [11-16]	14 [11-16]	15 [10-17]	0.531
SC	12.49 ± 3.43	13.44 ± 3.35	12.37 ± 3.42	12.05 ± 3.50	0.075

IF: Instrumental; EN: Encouragement; C: Control; EM: Emotional; SC: Strict Control; PC: Permissive Control [PC].
Data are shown as mean ± SD, median (interquartile range).

Table IV
Correlation of PFSQ subscale scores and visual perception scores of mothers

	Visual perception scores of mothers			p
	Underweight (n = 143)	Normal (n = 202)	Overweight (n = 35)	
EM	13.91 ± 4.27	12.98 ± 4.15	11.83 ± 4.26	0.015*
EN	32 [28-35]	32 [28-35]	29.5 [26-33]	0.033**
IF	9.5 [8-12.25]	10 [7-11]	9 [7-10.75]	0.154
PC	14 [12-16]	14 [11-16]	15 [10.25-16]	0.102
SC	12.68 ± 3.61	12.50 ± 3.36	11.92 ± 3.28	0.487

IF: Instrumental; EN: Encouragement; C: Control; EM: Emotional; SC: Strict Control; PC: Permissive Control [PC].
Data are shown as mean ± SD, median [interquartile range].

*There was statistically significant difference between underweight and overweight.

**There was statistically significant difference between normal and overweight.

for comparisons. There were no statistical differences in any aspect of feeding style between underweight, normal, and overweight children according to NS (table III).

When children were classified as UW, N, and OW due to maternal visual perception scores, there was a statistical difference between UW and OW children in the aspect of EM subscale scores, and between N and OW children in the aspect of EN subscale scores (p < 0.05) (table IV).

When maternal visual perception scores were classified as correct recognition, incorrectly low recognition,

and incorrectly high recognition with NS taken into account, there was a significant difference between the correct recognition and incorrectly low recognition group according to EM and PC subscale scores (table V).

Discussion

The sketches that were chosen in the present study had been used in several studies to assess parents/caregivers' visual perception of their child's nutritional status.^{11,15,16} Our findings showed concordance between

Table V
Correlation of PFSQ subscale scores and maternal misperception

	Maternal misperception			P
	Correct perception (n = 220)	Incorrectly low perception (n = 125)	Incorrectly high perception (n = 35)	
EM	12.68 ± 4.13	13.92 ± 4.37	13.86 ± 3.89	0.020*
EN	32 [28-35]	32 [28-35]	33 [29-35]	0.730
IF	9.5 [7-12]	9 [7-12]	9 [7-11]	0.850
PC	14 [11-16]	14.5 [12-17]	13 [11-16]	0.020*
SC	12.36 ± 3.26	12.45 ± 3.71	13.46 ± 3.41	0.213

IF: Instrumental; EN: Encouragement; C: Control; EM: Emotional; SC: Strict Control; PC: Permissive Control [PC].
Data are shown as mean±SD, median [interquartile range].

*There was statistically significant difference between correct and incorrectly low perception groups.

the visual perception scores and children's NS. In a previous study, it was reported that only one out of five mothers correctly recognize their overweight child as overweight, and most of these mothers were less educated.⁷ In our study, misperception was shown to be more likely (42.1%). Not using growth charts as a reference for obesity and underweight might explain the misrecognition. These charts would be meaningless and could seem complicated and incomprehensible if mothers do not understand how to use it.¹⁷

The misclassification of children's nutritional status according to sex is controversial. A recent study reported that parents of obese boys were more likely to misrecognize their sons' nutritional status as underweight or normal.¹⁸ However, Maynard et al.'s observation showed that girls were more likely than boys to be misclassified by their parents.⁸ In the present study, we did not find any statistical difference according to sex. The age of the study population could explain this result. In a similar study, Oude Luttikhuis et al. found that normal-weight children were more often depicted one sketch below their actual BMI, whereas parents of overweight children often selected a sketch that was skinnier compared with the actual BMI of their child.¹¹ Parents' perception could change with increasing age. Furthermore, among many mothers, there was a belief that as their child grows, the weight would be better distributed and the child would not end up obese.¹⁹

We aimed to evaluate how this misperception or misclassification affects parental feeding style. Increasing feeding or eating under emotional distress and using food as a reward are both assumed to eat more with cues other than physiological needs. In the PFSQ, the EF and IF scales measure these aspects of parenting style. In many societies, it is believed that having a "chubby" child is an indicator of good parenting and better child care.^{16,19} Parents are pleased when their child eats more, and they believe a heavier child is a healthier one.^{20,21} The EN scale measures this aspect of parenting style. Parental restriction or control of children's unhealthy and healthy food intakes is measured by the SC and PC subscales as parents

perceive their children either as underweight or overweight.^{22,23} In a recent study, the general parenting style has been summarized as authoritative parenting (high control and high warmth), which is characterized by parental responsiveness and respectful limit setting, and is associated with increased independence and self-control of children. Authoritarian parenting (high control and low warmth) shows strict discipline, insensitive to the child's emotional needs, and may result in children being motivated by external controls.²⁴⁻²⁶ In our study, the SC and PC subscales may be attributed to authoritative and authoritarian parenting styles, respectively. According to the maternal misperception, low PC and high SC scores are present when the mother's perception of her child's nutritional status is incorrectly high. When parents perceive their obese child as obese, they do not display any tolerance for eating more or eating snack foods. But when they perceive their child as underweight, they make the child eat freely. This finding is concordant with Birch et al.'s study, which reported that feeding restriction and authoritarian parenting are closely associated.²⁵ Many authors have studied the effects of parental control on obese and non-obese children, and varied results have emerged, from no difference to more parental control over eating for obese girls.^{27,28}

The effect of parental prompts and encouragements to eat on children's nutritional status is controversial. Some studies have shown these parenting styles to be associated with children's weight;^{28,29} some others have not.³⁰ In the present study, visual perception of mothers was shown to be one of the determinants of feeding style. The EN and EM subscales indicated the parents' wish for their child to eat more. The EM and EN subscale score differences were statistically important in overweight children based on the visual perception points (The scores were found to be lower in these subscales). The difference could be explained by mothers not encouraging their child to eat more when they perceive their child as OW, and their desire to keep their child fit. Another possible explanation was cultural difference, as mentioned above.

In conclusion, the need for intervention programs in children's eating habits and behaviors has emerged. Food and nutrition professionals implementing dietary change or preventing unhealthy development programs need more complex approaches to behavioral change that include parenting styles and family dynamics. These programs are unlikely to be successful without parental support, but such support is insufficient if mothers do not recognize their children's nutritional status correctly. We postulate that the best approach to preventing obesity and underweight may be to focus on achieving correct parental perception of the nutritional status of their children, thus improving parental skills and leading them to implement proper feeding styles.

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