

Maternal visual perception of children's nutritional status and feeding style

Ikromi Dalimunthe, Tiangsa Sembiring, Rita Evalina

Abstract

Background The percentage of exclusive breastfeeding in Background Mothers' visual perception is an important determinant for their children's nutritional status. Visual perception of their children's nutritional status is believed to drive mothers to modify or apply certain feeding styles, which influence the probability of either optimal growth or malnutrition.

Objective To determine if maternal visual perception of children's nutritional status influences maternal feeding style.

Methods The study was conducted in 3 kindergartens in Medan, North Sumatera, involving children aged 4-5 years and their mothers. Mothers filled three-part questionnaires, consisting of basic information, a series of body image sketches by a graphic artist to assess maternal visual perception, and the *Parental Feeding Style Questionnaire* (PFSQ) to assess maternal feeding style. Children's body heights and weights were measured to assess their nutritional status.

Results A total of 102 subjects were eligible for this study. Surprisingly, more than half of the mothers involved in our study misinterpreted their children nutritional status. Thus, there was no significant relationship between maternal visual perception, nor maternal misperception, and maternal feeding style. In fact, mothers tended to encourage their children to eat when they considered their children to have normal nutritional status.

Conclusion Mothers' visual perception does not influence feeding practice. [Paediatr Indones. 2021;61:34-8 ; DOI: 10.14238/pi61.1.2021.34-8].

Keywords: visual perception; feeding style; childhood nutritional status

Parents' visual perception, especially that of mothers, is an important determinant for their children's nutritional status.¹ It is the ability to recognize, distinguish, and interpret visual stimuli in relation to previous experience.² Mothers' visual perception of their children's nutritional status may influence maternal feeding style, type and quantity of food intake, and ultimately influence the probability of either optimal growth or malnutrition in their children.³ Especially early in life, children's eating habits depend mostly on maternal feeding practices.¹ Various factors, such as family, media, eating time, meal size, and maternal knowledge on malnutrition, can also affect feeding practices.⁴

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From the Department of Child Health, University of Sumatera Utara Medical School/Haji Adam Malik General Hospital, Medan, North Sumatera, Indonesia.

Corresponding author: Ikromi Dalimunthe. Department of Child Health, University of Sumatera Utara Medical School/Haji Adam Malik General Hospital. Jl. Bunga Lau No.17 Medan 20136, Indonesia. Ph. +62-81371720071; Fax. +6261-8361721; E-mail: romi_dalimunthe@yahoo.com.

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Unfortunately, while mothers presumably want to promote children's optimal growth, they may not always accurately interpret their children's nutritional status.⁵ A previous study reported that only one in five mothers could accurately recognize overweight/obesity in their children.⁶ A Netherlands study found that mothers often described their children as below their actual BMI.⁵ A Turkish study noted that up to 42.1% of mothers had such misperceptions.⁶ As such, we aimed to investigate the influence of maternal visual perception of children's nutritional status on feeding practices.

Methods

This cross-sectional study was conducted in August 2015 at 3 kindergartens in Medan, North Sumatera. Subjects were kindergarten students aged 4-5 years and their mothers, recruited by consecutive sampling. Mothers provided written informed consent. Inclusion criteria were mothers who lived in the same house with their children and who filled the questionnaire completely. Those children with chronic diseases, such as diabetes mellitus, malignancy, and congenital heart disease, were excluded. This study was approved by the Research Ethics Committee, University of Sumatera Utara, Faculty of Medicine.

The questionnaire consisted of three sections and took approximately 20-30 minutes to fill. The first section was on basic information of the child (age, gender, weight, height, and other medical conditions) and the mother (age, educational background, height, and weight). The second section was a series of body sketches created by a graphic artist (Scott Millard).⁶ Mothers were asked to choose one of seven graphics that most resembled their child. The selected body graphic was classified as underweight, normal, or overweight. The third section contained 27 self-assessment questions from the PFSQ.⁷ Each item was a statement on maternal feeding style, with answer options ranging from 1 for never to 5 for always. The PFSQ is a psychometric tool to assess four parameters: emotional feeding, instrumental feeding, prompting and encouragement to eat, and control over eating. Items for emotional feeding evaluated how parents feed their children in response to their children's emotion. For example, some parents tented

to give their children food when their children was hurt or sad. Items for instrumental feeding showed how parents feed their children according to their behavior. For example, parents tented to give food as reward when their children behave well. Another section in PFSQ was prompting and encouragement to eat, which assessed parents' encouragement to eat various type of food. Some parents tented to praise their children if their children wanted to eat new type of food. Last but not least, PFSQ also had section on control over eating. This section evaluated if parents determined the type and quantities of food that their children can eat.

Children's body weights were measured using a standard weight scale (manufactured by *Camry Electronic Ltd.*, China), with accuracy to 0.1 kg. Children's body heights were measured using a stature meter (manufactured by *GEA Medical*, Jakarta), with accuracy to 0.1 cm. Anthropometric measurements were classified according to the 2006 WHO *Growth Charts* as underweight (Z-score < -2 SD), normal (Z-score -2 SD to 2 SD), or overweight (Z-score > 2 SD).⁸

Data were analyzed by Cohen's Kappa, Kruskal-Wallis, and ANOVA tests using *SPSS for Windows IBM version 22*. We compared maternal visual perception classification to children's actual nutritional status, PFSQ score to children's actual nutritional status, PFSQ score to maternal visual perception classification, and PFSQ score to misperception classification. Results with P values <0.05 were considered to be statistically significant.

Results

There were 102 mother-child pairs included in this study. Baseline characteristics of children and mothers are shown in **Table 1**. Most children (65.7%) had normal nutritional status.

Table 2 shows that maternal visual perception did not project the actual nutritional status of their children ($K = -0.174$). Underweight children were considered to be normal by 57.1% of their mothers; children with normal nutritional status were considered to be underweight by 42.9% of their mothers, and overweight children were considered to be normal by 85.7% of their mothers. However,

Table 3 shows that maternal feeding style did not significantly differ according to children's actual nutritional status. **Table 4** shows that maternal feeding practice was not influenced by visual perception, although mothers tended to encourage their children to eat if they perceived their children to have normal nutritional status ($P=0.002$). There was also no significant difference between maternal feeding practice and misperception of children's nutritional status (**Table 5**).

Discussion

Nutritional status of children is heavily influenced by their parents.⁹ Factors such as family, parents,

Table 1. Baseline characteristics of mothers and children

Characteristics	(N=102)
Mean maternal age (SD), years	31.77 (5.84)
Maternal education, n (%)	
Senior high school	11 (10.8)
Bachelor's	85 (83.3)
Master's	6 (5.9)
Maternal nutritional status (BMI), n (%)	
Underweight	17 (16.7)
Normal	60 (58.8)
Overweight	25 (24.5)
Mean child age (SD), months	49.7 (4.56)
Child gender, n (%)	
Male	57 (55.9)
Female	45 (44.1)
Child nutritional status, n (%)	
Underweight	7 (6.9)
Normal	67 (65.7)
Overweight	28 (27.5)

Table 2. Differences between maternal visual perception and actual nutritional status of children

Visual perception score	Actual nutritional status			Total	K	P value
	Underweight	Normal	Overweight			
Underweight, n (%)	3 (42.9)	31 (46.3)	1 (3.6)	35 (34.3)	-0.174	0.005
Normal, n (%)	4 (57.1)	24 (35.8)	24 (85.7)	52 (51)		
Overweight, n (%)	0	12 (17.9)	3 (10.7)	15 (14.7)		
Total	7 (6.9)	67 (65.7)	28 (27.5)	102		

Table 3. Differences between PFSQ score and children's actual nutritional status

Variables	Total	Actual nutritional status			P value
		Underweight (n=7)	Normal (n=67)	Overweight (n=28)	
Emotional	12.9 (3.30)	13.8 (2.15)	13.4 (3.06)	12.6 (3.50)	0.404 ^a
Encouragement	31.5 (3.64)	33.1 (4.49)	31.6 (3.38)	31.3 (3.67)	0.408 ^a
Instrumental	9.5 (2.57)	9.6 (2.70)	8.9 (2.07)	9.7 (2.75)	0.427 ^b
Control	27.3 (4.16)	26 (7.44)	27.9 (2.73)	27.2 (4.25)	0.263 ^a

Data presented in mean score (SD); ^aKruskal-Wallis; ^bAnova

Table 4. Differences between PFSQ score and maternal visual perception of children's nutritional status

Variables	Actual nutritional status			P value ^a
	Underweight (n=35)	Normal (n=52)	Overweight (n=15)	
Emotional	13.8 (3.54)	12.6 (3.36)	11.7 (1.80)	0.052
Encouragement	30.7 (3.31)	32.7 (3.55)	29.3 (3.33)	0.002
Instrumental	9.7 (2.63)	9.4 (2.68)	9.5 (2.17)	0.566
Control	27.2 (5.29)	27.4 (3.90)	27.2 (1.32)	0.990

Data presented in mean score (SD); ^aKruskal-Wallis

Table 5. Differences between PFSQ score and maternal misperceptions of children's nutritional status

Variables	Maternal misperceptions			P value ^a
	Right perception (n=30)	Maternal perception lower than actual (n=56)	Maternal perception higher than actual (n=16)	
Emotional	12.1 (3.45)	13.6 (3.43)	11.8 (1.80)	0.056a
Encouragement	32.5 (3.50)	31.2 (3.40)	30.6 (4.46)	0.151b
Instrumental	9.4 (3.16)	9.4 (2.40)	9.8 (2.04)	0.628a
Control	28 (4.46)	27.4 (4.21)	25.8 (3.15)	0.408a

Data presented in mean score (SD); ^aKruskal-Wallis; ^bAnova

school, fast food, media, advertisements, culture, trends, mood, and habits can impact children's eating behavior.⁹⁻¹¹ In our study, we investigated the influence of maternal visual perception of children's nutritional status on maternal feeding style, which could ultimately affect the nutritional status of their children.

The prevalence of overweight among the pediatric subjects was quite high (27.5%). There has been an increased prevalence of childhood overweight and obesity worldwide, mainly associated with wrong eating behavior.¹² Children often consume high-fat diets and do not engage in enough physical activity, especially children living in urban areas. This phenomenon, therefore, has raised awareness in clinical and public health sectors.¹³

We found no relationship between maternal visual perception and children's actual nutritional status, which means that mothers were poor judges of their children's nutritional status. In our study, 54.9% of mothers visualized their children's nutritional status as lower than actual and 15.7% of mothers visualized their children's nutritional status as higher than actual (Table 5). Underweight children were mostly considered to be normal, while normal children and overweight children were mostly considered to be underweight and normal, respectively (Table 2). This finding was consistent with a Turkish cross-sectional study that found no relationship between maternal visual perception and the actual nutritional status of the children.⁵ Similarly, a Brazilian study reported that almost 50% of parents could not correctly classify their children's nutritional status, as parents tended to underestimate their children's nutritional status, especially in cases of overweight and obesity.¹² A meta-analysis in Nebraska, US, showed that despite increasing global awareness of obesity, more than half

of parents remained unaware that their children were overweight.¹³

Parental misperception could be due to several factors, such as educational background and culture. An US study showed that mothers with higher education had greater access to health updates and better awareness appropriate nutrition for children. However, mothers with lower education and lower socio-economic status were less aware of measures to prevent overweight and obesity in children.¹⁴ In addition, a common cultural misperception is that overweight in children is an indicator of better care. Parents tend to consider their children as normal, as long as children are able to perform usual daily routines. Parents are happy when their children eat more and believe that overweight children are healthier than thin ones.¹³ Therefore, pediatricians should raise parental awareness about their children's nutritional status and correctly monitor growth on a routine basis.^{12,15}

We also found no significant difference between maternal feeding style (PFSQ score) and children's actual nutritional status, possibly because mothers could not accurately detect malnutrition in their children. Maternal feeding practice also did not differ much with regards to their visual perceptions of nutritional status. Similarly, the Turkish study reported no significant relationships between maternal visual perception, parental feeding style (PFSQ), and children's nutritional status.⁵ Nevertheless, we noted that mothers tended to encourage their children to eat if they considered their children to be normal weight. According to maternal misperception, maternal misperception did not contribute to maternal feeding style significantly. In conclusion, maternal visual perception does not influence maternal feeding practice and children's nutritional status. As such,

pediatricians should give regular guidance to parents regarding to their children's nutrition and growth.¹⁶

Conflict of Interest

None declared.

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