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Association of parental feeding styles and the nutritional status of children ages 2 to 5 years in Jember, East Java, Indonesia

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ABSTRACT

Background and purpose: There is a great deal of mythical erroneous information regarding children's nutrition that can affect styles of parental feeding. If it is left uncontrolled, it may influence the nutritional status that led to malnutrition. The purpose of this study is to determine association between styles of parental feeding and nutritional status of children ages of 2 to 5 years old.

Methods: This was a cross-sectional study, conducted in November-December 2023 in Jember, East Java, Indonesia. Samples were 244 mothers who were selected purposively and satisfied the inclusion and exclusion criteria. Data was collected with interview which include parents' and children's characteristics, the feeding practices using a validated structured questionnaire (FPSQ-28), and children nutritional status. Descriptive analysis followed by correlation analysis were performed.

Results: Most parents earn more than IDR 2,000,000 and work as self-employed, whereas more than half of the respondents, both fathers and mothers, had at least a high school education, and the majority of height in both were 150-170 cm with normal body mass index. There is a weak positive association between the styles of parental feeding with the body weight for age (r=0.183; p=0.040) while no significant association with body weight for height (r=0.08; p=0.216).

Conclusion: Styles of parental feeding affected children's feeding and nutritional status, particularly when it comes to chronic conditions and in order to maintain children's nutrition or balanced nutrition, it is necessary to conduct education and evaluation of parental feeding styles.

Keywords: feeding practice, eating pattern, malnutrition, children.

INTRODUCTION

According to the 2022 Indonesian Ministry of Health survey data,[1] 17.1% of toddlers were underweight or malnourished, an increase of around 0.1% from 2021.[1] Children who experience chronic malnutrition within their first 1000 days of life will become stunted.[2] With about 35,000 (34.9%), or children under five, the stunting rate in the Jember region continues to lead the East Java region.[2]

Stunting can occur in children ages 2 to 5 due to chronic undernutrition. The period between the ages of two and five is crucial for the continued growth of the body and mind following the early growth spurt. Habits are starting to formed at this age, hence, having effective parenting practices is crucial to the development of future eating habits.[3] Even though there are an increasing number of snacks and fast meals which are now deemed safe since they include dairy, fruit, and vegetables, their inadequate nutritional value makes them unsuitable for young children to eat in significant amounts. According to research, young children aged 2–5 years old in the United States do not typically follow dietary guidelines for nutrients such calcium, vitamin D, potassium, iron and fiber as a result of which the child's growth and development is not optimal.[4]

Previous studies' findings indicated that malnutrition was four times more likely to occur in toddlers who were fed less than the average food, and it was twice as likely to occur in mothers with inadequate nutrition knowledge, and that malnutrition was caused by inappropriate parenting practices.[5] A lot of false information about feeding children exists in society in the shape of myths or regional customs. Malnutrition may result if this false information is uncontrolled. Giving accurate information about children's nutritional needs is hampered by communities with low levels of knowledge and a strong reliance on regional culinary customs.[6]

The term styles of parental feeding refer to a pattern of parenting or feeding behavior in which parents focus on the food's nature and intended use in an attempt to regulate or modify their child's eating habits. According to Baxter et al.'s research, inattentive feeding practices that restrict, coerce, or motivate kids to eat for reasons other than hunger can interfere with a child's capacity to control how much energy they consume. As a result, the child's ability to modify his/her eating habits in response to internal circumstances will be disrupted. Conversely, responsive feeding is characterized as a quick, fast-acting, developmentally appropriate reaction (not controlling or intrusive), which is depending on a newborn or child's feelings of hunger and fullness.[3]

The purpose of this study is to determine how styles of parental feeding affect children's feeding and nutritional status of children between the ages of 2 and 5 years old in Jember region, taking into account the aforementioned problem gap.

METHOD

This was a cross-sectional survey conducted in Jember, East Java, Indonesia conducted in November-December 2023. Population of this study were mothers of children aged two to five years who are the local residents (lived for at least a year) of the working area of public health centers (PHCs) on the public health rotation network of Faculty of Medicine, University of Jember (Patrang, Arjasa, Rambipuji, Sumbersari, Jember

Kidul, Kaliwates, Pakusari, and Gladak Pakem). We excluded mothers who did not provide their children with direct care or end the consent before the data collection was finished. The study included 244 parents of children who met the inclusion and exclusion criteria through the use of consecutive quota sampling (about 30 mothers who came to the integrated health services post/*posyandu* in each PHC area).

Data was collected with interview using a validated questionnaire, The Feeding Practices and Structure Questionnaire (FPSQ-28), to obtain parental feeding data. A standard protocol was used to measure the parent's and child's height and child's body weight using Onemeds' stature meter (accuracy of 0.1 cm) and digital body weight scale (accuracy of 0.1 kg).[7] We also collected data on parent's and children's characteristics including age, parent's education level, family income, child's age, address, child's sex, parent's body weight and height.

Economic status was categorized by income level according to Damayanti and Kurniati.[8] Parents' height is categorized according to Kusnadi,[9] who concluded from the 2013 National Health Survey result that Indonesian women typically range in height from 150 to 160 cm, while men typically stand between 160 and 170 cm tall. Body mass index of parents and children's nutritional status were measured and categorized following the Indonesian Ministry of Health regulation.[1] While the style of parental feeding was categorized into lack, sufficient or good according to Jansen *et al.*[10]

The OpenStat ver.2014 free license program was used to analyze the data for this investigation.[11] Styles of parental feeding and children's nutritional status between the ages of two and five were correlated using Spearman's rho test.

Ethical approval was obtained from the Health Research Ethics Commission (KEPK) RSD dr. Soebandi Jember No. 440/16164/610/2023.

RESULT

Most parents earn more than 2,000,000 IDR and work as self-employed, whereas more than half of the respondents, both fathers and mothers, had at least a high school education, and the majority of height in both were 150-170 cm with normal body mass index (Table 1).

The results of the FPSQ-28 description are shown in the Table 2. Regarding the reward for behavior, around one third of parents responded neutral or sometime for all items, however, 41.3% were never and rarely have given reward for good behavior, and 40.6% never and rarely gave rewards with something to eat and 41.7% never and rarely make the child eat to feel better when they were upset.

The majority of respondents were stated never and rarely gave rewards for eating for all four items in this section, namely using food as rewards if they finish their food (48.3%), offering a food rewards if they refuse the food they usually eat (48.8%), dessert as bribery to finish the main meal (52.8%), and warning to take a food away if the child did not finish the main meal (58.6%).

Table 1 Distribution of parents' education, occupation, income, height, and body mass index

Parent's characteristic		f	Percentage (%)
Father's education	No Education	1	0.4
	Elementary School	25	10.3
	Middle School	30	12.3
	High School	150	61.5
	Diploma	2	0.8
	Bachelor	35	14.3
	Magister	1	0.4
Mother's education	Elementary School	29	11.9
	Middle School	55	22.5
	High School	129	52.9
	Diploma	4	1.6
	Bachelor	26	10.7
	Magister	1	0.4
Father's occupation	Civil Servants	13	5.3
	Self-employed	126	51.6
	Merchant	27	11.1
	Laborer	56	23.0
	Farmer	16	6.6
	Teacher	5	2.0
	Unemployment	1	0.4
Mother's occupation	Civil Servants	2	0.8
	Self-employed	21	8.6
	Merchant	12	4.9
	Laborer	7	2.9
	Farmer	6	2.5
	Teacher	8	3.3
	Unemployment	188	77.0
Family Income (IDR)	<500,000	9	3.7
	500,000 - 1,000,000	30	12.3
	1,000,000 - 2,000,000	79	32.4
	> 2,000,000	126	51.6
Father's height	<150 cm	3	1.2
	150-170 cm	204	83.6
	>170 cm	37	15.2
Mother's height	<150 cm	13	5.3
	150-170 cm	231	94.7
	>170 cm	0	0.0

Parent's characteristic		f	Percentage (%)
Father's BMI	Severe underweight	2	0.8
	Underweight	7	2.9
	Normal	169	69.3
	Overweight	42	17.2
	Obese	24	9.8
Mother's BMI	Severe underweight	0	0.0
	Underweight	4	1.6
	Normal	179	73.4
	Overweight	28	11.5
	Obese	33	13.5

Responses to the persuasive feeding section, the majority of respondents (52.5%) stated that they would attempt to encourage their kids to eat even if they responded, "I'm not hungry"; as many as 38.9% of respondents answered if the child ate what was given they would get a compliment; as many as 39.3% respondents explained things, particularly the advantages of food to make children want to eat it at home; as many as 22.1% respondents consistently told kids to eat the food that was served; and as many as 36.9% respondents occasionally said something to express his disapproval of a child who didn't want to eat.

In the section on overt restrictions, 46.3% agreed that they should ensure their kids don't eat too much sweet food; 38.5% agreed that they should ensure their kids don't eat too much of their favorite foods; 34.4% agreed that they should keep some foods away from their kids; and 45.1% agreed that they should control their kids' diet to prevent them from eating too much fast food. Meanwhile for the covert restriction section, 36.1% of respondents said they "often" avoid purchasing sweets and snacks like chips and bringing them with them. They also frequently avoid dining in cafes or restaurants that serve unhealthy food. Up to 36.9% of respondents said they occasionally avoid purchasing food they enjoy because they don't want their kids to consume it. Of these, 34.4% of respondents said they occasionally avoid purchasing cakes and biscuits and bring them home.

Responding to the structured meal setting part question, 29.5% of respondents indicated that they frequently let their kids wander around while eating. Regarding the three questions in the structured meal timing section, it is known that most respondents 41.8% chose "often" to let the child choose when to eat, "sometimes" to choose when to eat snacks, and most respondents chose "often" to decide when the child should eat the main course.

Table 3 shows the crosstabulation and correlation analysis of parental feeding style and nutritional status. For children's nutritional status, it showed similar pattern for parent feeding style comparing the sufficient and good feeding practice, a relatively significant different was showed for body weight where children with sufficient feeding was twice more likely were underweight compared to those with good feeding. Based mothers' BMI, when mother's BMI was higher the more likely they shown sufficient feeding practice (r=0.871) but it was not statistically significant. The only statistically significant association was for children weight for age with a weak correlation (r=0.183, p = 0.004)

Table 2 Feeding behaviour according to FPSQ-28

Items in FPSQ-28	Response (percentage)				
	1	2	3	4	5
Rewards for Behaviour					
Favourite foods for good behaviour [a. 1]	7.4	12.7	38.5	36.0	5.3
To behave promise something to eat [b. 4]	13.5	24.6	38.5	21.3	2.0
Reward with something to eat [b. 4]	12.3	28.3	35.7	19.7	4.0
Eat to feel better when upset [b. 4]	12.7	29.0	34.8	20.5	2.9
Rewards for Eating					
Using food as a reward [b. 5]	15.6	32.7	29.9	18.9	2.9
Offering a food reward [b. 3]	14.8	34.0	28.7	21.3	1.2
Desserts as a bribe [b. 4]	24.6	28.2	24.2	21.0	2.0
Take a food away [b. 5]	23.8	34.8	22.6	16.8	2.0
Persuasive Feeding					
Try to eat anyway [a. 1]	2.9	12.6	24.4	52.0	8.1
Insist your child eats [b. 3]	17.9	20.3	28.5	27.6	5.7
Praise [b. 4]	6.5	15.9	22.8	38.6	16.2
Reason [b. 5]	14.6	11.0	18.3	39.0	17.1
Tell [b. 5]	10.9	13.0	22.0	12.2	41.9
Overt Restriction					
Not eat too many sweet foods [a. 1]	2.8	12.6	26.4	46.4	11.8
Not eat too much favorite foods [a. 1]	4.9	21.6	31.5	38.4	3.6
Keep some foods out of reach [a. 1]	7.1	20.1	31.7	34.0	7.1
Would eat too many junk-foods [a. 1]	4.1	14.7	28.6	45.0	7.6
Covert Restriction					
Avoid sell unhealthy foods [b. 2]	13.2	18.9	20.1	11.3	36.5
Avoid buying lollies and snacks [b. 2]	6.5	12.5	35.6	10.2	35.2
Not buy foods you would like [b. 2]	11.2	25.4	36.8	5.0	21.6
Avoid buying biscuits and cakes [b. 2]	8.5	30.6	34.4	6.5	20.0
Structured Meal					
Wander during a meal [b. 4*]	19.3	20.9	22.1	29.9	7.7
Eats at the table [b. 4]	16.4	28.6	23.8	16.4	14.8
Firm about where [b. 2]	16.0	26.6	32.0	16.4	9.0
Structured Meal Timing					
Child decides when [b. 4*]	11.5	21.3	27.0	31.6	8.6
I decide when snack [b. 4]	5.7	20.5	36.9	24.2	12.7
I decide when meals [b. 4]	4.5	14.3	24.2	41.8	15.2

* Item is reverse coded, n=244

[a] Response options: (1) Disagree. (2) Slightly disagree. (3) Neutral. (4) Slightly agree. (5) Agree

[b] Response options: (1) Never. (2) Rarely. (3) Sometimes. (4) Often. (5) Always

[c] Response options: (1) You only. (2) Mostly you. (3) You and your child equally. (4) Mostly your child. (5) Your child only

Table 3. Cross-tabulation between children's nutritional status, parents' body mass index, and style of parental feeding

Variable		Style of Parental Feeding				
		Sufficient		Good		r (p-value)
		(n)	(%)	(n)	(%)	
Children's nutritional status*						
Weight for height	Severe underweight	5	2.9	2	2.8	0.080 (0.216)
	Underweight	19	11.0	4	5.5	
	Normal	137	79.7	60	83.3	
	Overweight	7	4.1	4	5.5	
	Obese	4	2.3	2	2.8	
Weight for age	Severe underweight	3	1.7	4	5.5	0.183 (0.040)
	Underweight	15	8.7	7	9.7	
	Normal	143	83.1	55	76.4	
	Overweight	7	4.1	4	5.5	
	Obese	4	2.3	2	2.8	
Parents' body mass index**						
Father's BMI	Severe underweight	1	50.0	1	50.0	0.073 (0.866)
	Underweight	5	71.4	2	28.6	
	Normal	122	72.2	47	27.8	
	Overweight	27	64.3	15	35.9	
	Obese	17	70.8	7	29.2	
Mothers' BMI	Severe underweight	0	0.0	0	0.0	0.871 (0.574)
	Underweight	2	50.0	2	50.0	
	Normal	124	69.3	55	31.7	
	Overweight	22	78.6	6	21.4	
	Obese	24	72.7	9	27.3	

r= correlation coefficient, *BMI*=Body Mass Index; *column percentage, **row percentage. Bold values= statistical significance p<0.05 for Spearman's rho test

DISCUSSION

This study explored association between parent feeding style and children nutritional status and also look at the relation between fathers' and mothers' BMI with the feeding practice. We found weak association between feeding practice with children nutritional status based on weight for age indicator which indicate chronic malnutrition status, but not significant for the weight for height indicator.

Acute malnutrition is a nutritional deficit with a varied clinical manifestation arising from insufficient energy or protein consumption.[12] Most children suffering from primary acute malnutrition can be treated at home with nutrition counseling for parents, household food security, and the provision of meals derived from

animals high in micronutrients and important fatty acids.[13,14]

On the other hand, a number of variables, such as insufficient food intake, substandard parenting and caregiving, inappropriate eating habits, and concomitant illnesses, can contribute to chronic malnutrition or stunting in children.[15] The primary causes of child malnutrition, which is defined by excesses and/or deficiencies in nutrient intake, include inadequate feeding habits.[16] Chronic malnutrition, for instance, can result from eating meals that are too high in calories and include high levels of trans fats, saturated fats, free sugars, salt, or sodium, as well as from consuming insufficient amounts of fruits, vegetables, and fiber.[5]

There are other approaches of feeding children that have been around for a while, such as the idea of rewarding behavior or eating behavior. According to this study result, most participants used the idea of rewarding children by promising and providing presents in the shape of their preferred cuisine when the children behave well or when they get irritated. According to a study by Belot and James, children who are used to getting incentives for their behavior would choose their meals more independently and will eat more fat, high-calorie foods, and carbohydrates than children who are not in the habit of receiving rewards for their behavior.[17] But another study also warned about the backfire of incentive.[18,19] A vicious loop may emerge whereby parents reward their children with food when they exhibit food approach behavior, thus exacerbating the development of bad eating behaviors such as fussiness, emotional eating and might causing picky eater behaviour.[20]

We found most parents of the children who have good nutritional status utilize a feeding style that rewards eating infrequently, while most respondents feed their children persuasively most of the time. It is challenging to determine, nevertheless, if feeding persuasion benefits children's growth.[21] A study by Costa et al.[22] showed that children who were accustomed to being given rewards for behavior would be more independent in choosing their daily food and consume more carbohydrates, high calories and fat compared to children who did not have the habit of undergoing rewards for behavior. A study also stated that children with good nutritional status had better and more responsive behavior in completing daily tasks.[21,23]

The study's findings also demonstrate that, in children who have a healthy nutritional status, most feeding patterns consent to over-restriction, with the occasional instance of covert-restriction. A frequently used structured meal setting pattern and structured meal timing pattern are also present in most children with good nutritional status. The arrangement of mealtimes and locations is crucial for promoting healthy eating, particularly in light of findings that children who eat with greater enjoyment and less fuss was more likely to eat healthily.[24]

In healthcare settings, particularly public health centers, which are frequently the first medical facilities that the public visits, it is imperative to have knowledge about styles of parental feeding for children in order to raise public awareness of the significance of this issue, which is intimately linked to children's development and nutrition.[25] So that children's nutrition, or balanced nutrition, will continue to be satisfied, it is required to conduct out education and evaluation, one of which is related to the need of regulating eating patterns and the importance of parental monitoring of children's eating patterns.[26]

This study is subject to some limitations. The parental feeding style was assessed with questionnaires only, without any objective assessment, so there are potential bias or social desirability bias. For the statistic interpretation, due to the absence of respondents with poor feeding style, the result of the correlation must be interpreted with caution, further study should explore wider range of feeding practice alongside observation.

CONCLUSION

Styles of parental feeding impacted children's feeding and long-term nutritional status in children ages two to five in the Jember region. Reward for behavior, persuasive feeding, structure meal setting, structure meal timing, and permission to over-restriction were the most common styles of parental feeding used with children in good nutritional status while the covert restriction and reward for eating were used infrequently. It is advised that assessments and education be carried out through communities, one of which should address the necessity of controlling eating habits and the significance of parental supervision of their children's eating habits.

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AUTHOR CONTRIBUTION

ACNM and DAR handling from conception and design. The data collection was coordinated by EN and AH. AMR and IFK attested to the data's acquisition. The data analysis and interpretation were completed by YS and ISWA. ACNM and DAR were responsible for drafting the text or critically editing it for significant intellectual content.

CONFLICT OF INTEREST

Authors indicated that there was no possible conflict of interest in their work.

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