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Study of the association of socio-demographic factors and feeding practices with the dietary intake in 3-6years old children

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Abstract:

This paper aimed to investigate the association of social factors and feeding practices with the diet in 3- 6 years old children. A cross-sectional study of 208 parents with children aged 3-6 years was carried out in 30 primary schools of Rasht, Iran in 2011. Measures included social factors, aspects of parental control practices and the child's diet. Mothers reported both their own and their child's demographics. Aspects of child feeding practices were assessed by using Comprehensive Feeding Practices Questionnaire (CFPQ). Food Frequency Questionnaire (FFQ) was then used to assess the child's dietary intake. Height and weight of mothers who participated in the study were also measured. The role of parental and child social and demographic factors and child feeding practices in predicting children's diet was assessed by using multiple block entry linear regression. Results showed that children's diet is related to the mother's age, marital status, education and the child's age and sex. Moreover, the mother's encouragement of balanced diet and variety, food as reward, involvement of the child in food preparation, role modeling, monitoring, child control, restriction for health, and education about nutrition were also related to the child's diet. The results showed a significant association between social factors and control practices on one hand, and aspects of the child's diet, on the other hand.

Keywords: Feeding Behavior, Demographic Factors, Child Nutrition

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Introduction

Malnutrition is one of the main problems in developing countries and some areas in developed countries (1). WHO documents show that in less than five years old children, malnutrition is associated with half of deaths among children worldwide and those children who survive from malnutrition, suffer from mental and physical disorders (2). On the other hand, obesity prevalence in children in developing and developed countries has become a public health problem (3).

Food habits in childhood will probably continue in adulthood. So, unhealthy diet in childhood can lead to hazards in the whole life span (5). Children's diet in preschool ages may be affected by parents, friends and media (6). The parents influence in early childhood has been recognized as the most important factor because they prepare the food, perform feeding and act as a role model for their children (7,8). In preschool ages, parents feed their children with different practices.

The feeding practices used by parents affect child's nutrition (9).

Many studies have shown that feeding practices are associated with child's ability for food intake regulation (5), food preferences (10), calorie intake and body weight (11). Parents with different social, economic and cultural status use different practices for child feeding control (9, 12, 13). Due to extension of feeding styles, the results of similar studies on the effect of these practices were inconsistent. Some studies report the benefits of child's eating control by parents (12-14), whereas other studies accounted for child malnutrition or obesity (15-19).

So, the current study aimed to investigate which parents use which types of feeding control practices to manage their children's diet and to assess the impact of these practices on children's dietary patterns.

Material and Methods

This cross-sectional study was carried out from March 2011 to August 2011 in 30day care centers and preschools across Rasht, Iran.

210 children aged 3 to 6 were selected through the second-stage cluster random sampling. Children who had any form of congenital and metabolic disorder that potentially interacted with mother and child's eating behaviors were excluded and 208 mother-child pair entered the study. Data on social and demographic factors including mother's age, marital status, education, occupation and parental income was collected. Mother and child's height and weight was measured at the beginning of interview. Aspects of child feeding practices were assessed by using the validated Comprehensive Feeding Practices Questionnaire (CFPQ) (19). This questionnaire consisted of 46 questions related to child's control of feeding interactions (four items; e.g., "Do you allow this child to eat snacks whenever she/he wants?"), using food to regulate the child's emotional states (four items; e.g., "Do you give this child something to eat or drink if she/he is upset even if you think she/he is not hungry?"), encouraging balance and variety

(four items; "I encourage my child to eat a variety of foods"), providing a healthy feeding environment (two items; e.g., "Most of the food I keep in the house is healthy"), food as reward (three items; e.g., I offer my child his/her favorite foods in exchange for good behavior), child's involvement in food preparation (three items; "I involve my child in planning family meals"), modeling eating behaviors (four items; "I model healthy eating for my child by eating healthy foods myself"), monitoring (three items; e.g., "How much do you keep track of the high-fat foods that your child eats?"), pressure to eat (four items; e.g., "My child should always eat all of the food on her plate"), food restriction for health purposes (four items; "I have to be sure that my child does not eat too much of his/her favorite foods."), food restriction for weight control (seven items; "I have to be sure that my child does not eat too many high-fat foods") and teaching about food and nutrition (three items; e.g., "I discuss with my child why it's important to eat healthy foods"). Items were assessed using 5-point likert scales ranging from "Never" (1) to "Always" (5) or "Disagree" (1) to "Agree" (5). In order to collect data related to child's diet, asemi quantitative food frequency questionnaire (FFQ) was used to survey the frequency of consumption over a (one year) period (20). Data was collected about 12 food categories: whole grains, refined grains, potatoes, dairy products, vegetables, fruits, legumes, meats, simple sugars, honey and jams, soft drinks and snacks and desserts. Data was recategorized in seven main food groups including grains, dairy products, fruits and vegetables, meats, simple sugars, soft drinks and snacks and desserts.

The role of maternal socio-demographic factors and child feeding practices in predicting the quality of children's diet was assessed by using multiple block entry linear regression. Bonferroni correction coefficient was used to determine significance level at adjusted p value =.0002 (21).

Results

Mothers' and children's general characterist

Table I. Mothers' and children's general characteristics

	%	N	Mean	SD		%	N
Child gender					Father highest certified educational qualification		
Boy	60	124			<diploma	9.6	21
Girl	40	84			Diploma	25	51
Child age (years)			4.7	.88	>diploma	65.4	136
Child birth weight			3.4	.43	Mother's smoking		
Child BMI			17.73	5.86	Yes	0	0
Mother age			31.67	4.59	No	100	208
Mother height (cm)			157	32	Father's smoking		
Mother weight(kg)			71.54	1.72	Yes	25	52
Mother BMI			33.22	3.07	No	75	
Single parent status					Parent's income		
Yes	3.5	18			Low	1.9	
No	96.5	184			Medium	45.7	95
Mother highest certified educational qualification					High	44.4	
<diploma	1.9	4			Mothers' Occupation		
diploma	40.4	84			Housewife		
>diploma	57.7	120			Employed	75	156

are shown in Table 1. The majority of mothers was married (96.5%), employed (75%) and had a university degree (65.4%). Most of the mothers were identified to be overweight or obese (mean BMI 33.3 +/- 3.07). In terms of the child feeding practices, mean score of any subscale of CFPQ was determined. Higher scores for the feeding scales reflected greater use of scales (3).

The frequency of each feeding practice used by the mothers is shown in Table 2. The most commonly used feeding practice was environmental control, encouragement of balance, role modeling and teaching about nutrition. About a half of the sample reported using food as a reward and restriction for weight control and only a minority used emotion regulation. In terms of the child diet, food groups' intake of children is shown in Table 3. Data was classified by pre-existing feeding guide (22). About a half of the mothers reported fruits and vegetables intake of their children less than recommendations. More than a half of the children had meat group intake less than recommendations. About a half of the children had more than 2 servings of simple sugars and snacks groups on an average day. Multiple block

Table II. Parental control practices

	%	N		%	N
Child's control			Modeling		
Low	36.4	72	Low	0	0
Med	3.8	8	Med	7.7	16
high	61.5	128	high	92.3	192
Emotion regulation			Monitoring		
Low	86.5	180	Low	9.6	20
Med	11.5	24	Med	5.8	12
high	2	4	high	84.6	176
Encourage balance and variety			Pressure		
Low	1.9	4	Low	63.5	132
Med	0	0	Med	5.8	12
high	98.1	204	high	30.7	64
Environment			Restriction for Health		
Low	.5	1	Low	19.2	40
Med	3.4	7	Med	14.5	28
high	96.1	200	high	66.3	136
Food as reward			Restriction for weight control		
Low	36.5	76	Low	46.2	96
Med	17.3	36	Med	7.6	16
high	46.2	96	high	46.2	96
Involvement			Teaching about nutrition		
Low	1.9	4	Low	2.4	5
Med	9.6	20	Med	0	0
high	88.5	184	high	97.6	203

Serving per day			Portion per day		
	%	N		%	N
Grains			Simple sugar		
<3	18.3	38	<2	55.8	116
≥3	81.7	170	≥2	44.2	92
Dairy products			Soft drink		
<3	23.1	46	<1	80.8	168
≥3	76.9	160	≥1	19.2	40
Fruits and vegetables			Dessert and snack		
<5	48.1	100	<2	55.8	116
≥5	51.9	108	≥2	44.2	92
Meats					
<2	59.6	124			
≥2	40.4	84			

entry linear regression was used to predict children's diet using parent/child demographics (block 1) and feeding practices (block 2) as independent variables.

Children ate more grains if their mothers were single, and their mothers used more encouragement of balance and variety, food as reward, involvement and monitoring, and used less modeling and teaching about nutrition ($p < 0.0002$). Children ate more dairy products if their mothers were more educated and used less Child Control and Involvement ($p < 0.0002$). Children ate more fruits and vegetables if their mothers used less child control and involvement and more modeling ($p < 0.0002$).

Meat group intake was higher among girls, and children ate more meat if their mothers were older, housewives or more educated. Children ate more soft drinks if their mothers had a job, their fathers were less educated and their mothers used less involved. Snack group intake was higher among boys, and children ate more snacks if their mothers were less educated, and their mothers used less modeling. Simple sugars group intake was higher among boys. Significant results are shown in Table 4.

Discussion

The present study aimed to explore the feeding practices used by mothers and their impact on children's food intake and BMI. The results

showed a significant relation between social factors and control practices on one hand, and aspects of the child's diet on the other. In terms of frequency of mother feeding practices, the results showed that the most commonly used approaches were environmental control, encouragement of balance and variety, modeling and teaching about nutrition. Previous research in England indicated that the most commonly used approaches were modeling, attempts to influence the child's attitudes and norms, and use of moderate pressure (23). Although the results from the current study also showed that the modeling practices were used frequently, other frequent practices were not same in the two studies.

Pressure-to-eat practice was explored in our study, but this was commonly used only in 30 percent of mothers. In the present study, mothers of boys used the pressure practices more frequently than others. So, the differences between the frequency rates of pressure-to-eat practices may be due to children gender. In other studies on the differences in French and American societies, the results showed that American mothers had higher BMI and use of food for non-nutritive purposes was more prevalent in the US mothers (24). The results from the current study support this and illustrate that higher BMI is associated with increased use of food as a reward.

Table IV. The role of maternal socio-demographic characteristics and control practices in predicting children's intake of different food groups

	Grains	Dairy products	Fruits and vegetables	Meats	Soft drink	Snacks	Simple sugar
	B	B	B	B	B	B	B
Block 1							
Child gender	-0.021	0.163	0.097	*0.300	0.083	-0.507*	-0.371*
Mothers age	-0.007	0.007	0.010	*0.059	0.031	0.012	-0.020
Single parent	0.518*	-0.039	-0.350	0.004	-0.444	-0.013	-0.308
Stay at home mother	-0.590	-0.064	-0.125	-0.185*	0.173*	0.024	0.313
Mother Education	-0.057	0.469*	0.078	0.294*	-0.080	-0.391*	-0.018
Father Education	0.207	0.357*	0.082	0.170	*-0.225	-0.035	0.106
Block 2							
Child's Control	-0.004	-0.184*	-0.377*	0.108	0.127	0.119	0.015
Encourage balance and variety	1.155*	0.419	0.386	-0.086	-0.274	0.059	0.227
Food as reward	0.126*	-0.076	0.032	0.009	0.085	0.063	0.093
Involvement Modeling	0.256*	-0.278*	-0.331*	0.051	-0.339*	-0.197	0.032
Monitoring	-0.885*	0.106	0.801*	-0.201	-0.295	-	-0.259
Restriction for Health						1.072*	
Teaching about nutrition	0.545*	0.247	-0.101	-0.043	0.166	0.239	0.155
	0.034	-0.109	-0.265*	-0.280	-0.137	0.028	0.070
	-0.302*	0.159	0.203	0.301	-0.014	-0.151	0.148

*: $P < 0.0002$

In terms of association of social-demographic factors with child's food intake, the results showed that children with a similar profile tend to use similar diets. Children had higher intake of meat groups and lower intake of soft drinks if their mothers were housewives. In a previous research, the results showed that the mother's job is unrelated to the children's diet (12). The difference in occupation definition may be the cause of the difference in results. In the present study, job was determined as minimum 8 hours

daily work. To conclude, the results showed that stay-at-home mothers used modeling practices for child feeding more frequently and their children had more healthy food intake.

Snack and simple sugar intake was significantly higher in boys, whereas meats group intake was higher in girls. In some studies, results have shown no relation between child's gender and child's food intake (12, 25, and 26). The cause of this may be the differences between the common

feeding practices to girls and boys. In our study, mothers of boys used the pressure practices more frequently than others.

The results from the present study show that mother's age is related with child's meat intake. A similar study indicated that mother's age is negatively related with the intake of healthy snacks in children (12). This result is in contrast with the results of the present study. The difference may be due to the age of the mothers. The mean age of mothers in the cited study was 38, whereas in our study the mean age was 32. The increase of mother's age up to 35 probably promote child's food intake, but the ages of 35 and greater may inversely affect child's nutrition.

The intake of grains was significantly higher in single parent's children. Results from a similar study have shown that the marital status has no relation with food groups' intake (12).

Results from our study have shown that meat and dairy product intake was higher and soft drinks and snacks intake was significantly lower in children whose parents had higher education (27). This is in line with a research illustrating how education may have positive effect on a child's diet (28). To conclude, the results show that higher education of parents is significantly associated with increase of healthy foods intake and decrease of unhealthy snacks. The boys eat more unhealthy snacks and The mother's job inversely influence on some aspect of child's diet.

The present study also aimed to examine the impact of different parental feeding practices on children's food intake. The results showed that children ate more grains if their mothers reported higher levels of encouragement of balance and variety and using food as reward. Children ate more grains and less fruit, vegetables, soft drinks and dairy product if their mothers reported higher levels of child involvement in food scheduling. Also, children ate more grains if their mothers reported higher levels of monitoring. Children ate more fruits and

vegetables and less grains if their mothers reported higher levels of modeling. Children ate more grains if their parents reported higher levels of teaching about nutrition. Children ate less fruit, vegetables and dairy products if their mothers reported higher levels of child control. And Children ate less fruit and vegetables if their mothers reported higher levels of restriction for health. Previous research indicated that child feeding has a relation to the child's diet, but this relation was inconsistent. These results provide some support for previous researches who have described the association between modeling and lower intake of unhealthy foods (29, 30).

This study suggests that child authority may be associated with less healthy eating practices which is in line with research indicating that overt and covert parental control can be beneficial (12). In conclusion, the results show that some forms of parental control can be associated with child's intake of different food groups (grains, dairy products, fruits and vegetables, soft drinks and snacks). On one hand, children ate more fruits and vegetables and less snacks if their mothers reported higher levels of modeling. On the other hand, child authority was associated with fewer intakes of fruits, vegetables and dairy products.

Conclusion

The results show that mothers use several different strategies to feed their children. Also, some feeding practices were related to the children's diet. A healthier diet was observed more often in the families of stay-at-home mothers and well-educated mothers. The results from this study indicate that children ate more healthy food and less unhealthy if their parents reported higher levels of modeling and lower level of child control.

There are, however, some problems with the current study that need to be addressed. The study had cross-sectional design for better understanding the causality and the relationship between variables. Although the study aimed to explore the impact of parental control practices on diet and BMI, it is possible that the diet and

BMI in turn influence these practices. Longitudinal studies are needed to address this possibility. Finally, the study relied on parental reports of their children's diet rather than the children's own reports, which facilitated collection of data from a larger sample.

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