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The Relationship between the Awareness and Performance of Parents Regarding Food Security with Anthropometric Indices among School-age Children in Bushehr, Iran, during 2017

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Abstract

Parents' awareness and performance plays a key role in food safety of the children. This study aimed to investigate the relationship between parents' awareness and performance regarding food security with anthropometric indices in school-age children from Bushehr, Iran, during 2017. Data in this descriptive-analytical study was collected from 402 parents using questionnaires on awareness and performance as well as an anthropometric indices. According to the results, 313 parents had a good level of Food security awareness. Cereal consumption was insufficient in 70.4% of the children. 37.4% of the children were overweight or severely obese. Parents awareness and their performance revealed no significant relationship with children height and weight indices (P<0.05). However, there was a significant relationship between awareness level and BMI-for-age index (OR=0.44; P=0.02). The overconsumption of dairy in overweight children (OR=0.51; P=0.03) and insufficient consumption of vegetables in obese or severe obese children were significant (OR=1.04; P=0.03). The over- or insufficient consumption of food raises the probability of parents' unawareness about the standards of food serving for children.

Keywords: Awareness, Children, Food Security, Performance

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Introduction

Kids and young children are the most important natural resources and the biggest human capital for development in each community (1). Appropriate nutrition is necessary for healthy growth, healthy body structure, strength of immune system, as well as cognitive and neurological development (2). When it comes to the nutrition, food, and the health measurement of individuals and families, the issue of Food security arises since the main condition for a healthy life is to have a healthy nutrition (3).

Food security exists when all people have permanent access to the sufficient, healthy, and nutrient foods both physically and economically. Moreover, the accessible food provides a nutrition regime compatible with individuals' preferences for an active life (4). Food insecurity is the counterpoint of Food Security and refers to the limited access to nutritious food or having limited ability to obtain healthy and socially acceptable foods (5). According to the statistics published by Food and Agriculture Organization (FAO) in 2015, one billion people across the world do not have access to safe and healthy foods. From these people, 13% live in USA and 62% live in Asia (6). According to a systematic investigation conducted in Iran, food insecurity is approximately 20-60% in the country (7).

Poverty and food insecurity among children cause malnutrition, increased level of mortality and disability, as well as reduced rate of mental and physical growth (8). Malnutrition among school-age children is a major concern for public health. According to World Health Organization, malnutrition is the cellular imbalance between nutrients supply and body demand for growth, development, and special performances (9). Malnutrition has lifelong consequences that not only cover the whole life of a child, but also affects the next generations (10). Malnutrition in a global level accounts for more than 35% of mortalities and approximately 11% of disease burden (11). The most common way of assessment of nutrition status is anthropometrics (12).

One of the factors affecting Food security is parents' awareness and their nutritional behavior (13). Generally, those parents who have sufficient knowledge about their children's nutrition show appropriate performances, which are necessary for the success of their children and improvement of their health level (14). As a result, present study was conducted to determine the relationship between parents' awareness and their performance regarding Food security and anthropometric indices among school-age children.

Methods

This cross-sectional descriptive-analytical study was conducted on 402 parents and their school-age children (the elementary school age in Iran is 6-13) in Bushehr, Iran, during 2016-2017.

The sample size was estimated at 384 individuals based on the literature and using n= $Z^2_{1-\alpha/2}$ P (1-P)/d^2 formula. A randomized two-stage sampling was conducted among elementary schools covered by 10 comprehensive health centers across Bushehr. Despite the estimated number of participants was 386, the sample size was composed of 420 individuals. Given that the sample included 10 centers, and each school also had 6 grades, 7 students were selected from each grade, which led to 420 participants. Considering the number of girls and boys attending to public and private schools, 30 girls from public schools and 12 ones from private schools were selected. On the other hand, 24 boys from public schools and 18 ones form private schools were enrolled in this study. One of the centers did not cover any private school for boys, and consequently the sample size reached to 402 individuals.

The inclusion criteria were: 1) free of systematic or organic disease, 2) no consumption of drugs affecting growth according to the health records of the students, 3) non-existence of self-reported neuropsychological disorders in parents, 4) living with both parents, 5) no support from any organizations.

Data collection tools included four sections: demographic data form, awareness questionnaire, parents' performance questionnaire (24-Hour Food Frequency Questionnaire), and anthropometric indices measurement. The demographic data form was a researcher-made questionnaire consisting of 20 questions, which was designed according to the demographic variables required for the purposes of the study. The validity of awareness questionnaire and parents' performance regarding Food security was assessed according to Waltz 2010 (15) through the following steps: reviewing the literature on children Food security, designing questionnaire items according to three areas of Food security as well as local and international studies. Accordingly, this questionnaire was composed of 15 questions

related to awareness with a 3-point Likert scale (True, False, I don't know) and performance questionnaire on the daily consumption of five main food groups (six categories of cereals and legumes, meat, fruits and juices, vegetables, nuts and dairy products) in a categorized form and with a serving special for school-age children in the form of a table and with a scale (2-3 times per day, 2-3 times per week, once a week, 2-3 times per month, once a month, and rarely or never). It should be noted that awareness questionnaire has three negative items.

When the research plan was confirmed, the researcher received the required permissions from Department of Education. After the introduction of research to schools, the students were selected randomly based on their grade and attendance. In the next step, initial information were obtained from students (took about 3-5 min for each individual), and the questionnaires were distributed among the participants. The students were required to fill out the questionnaires by their parents and return them to the head of the school after a week. After gathering all questionnaires, the researcher-made educational pamphlet, including the correct answers along with a gift for encouraging the students to return the questionnaires, which were handed to the participants by the head of the school.

The scoring procedure for the awareness questionnaire was based on the literature and FAO guideline regarding awareness and nutritional performance (16). Accordingly, parents who had correctly answered 70% of the awareness-related questions or more (10.5 scores from 15) were categorized as parents with desirable knowledge and those who gave correct answer to less than 70% of the questions were categorized as parents lacking sufficient awareness (wrong and "I don't know" answers received zero point and "I know" answers received 1 point). Negative questions were scored reversely ("I don't know" and correct answers received zero point and wrong answers received 1 point).

Regarding performance, the cereal group in food frequency questionnaire (FFQ) was divided into three groups for the age range of 6-11 years based on the serving (less than 6=insufficient, 6-11=sufficient, more than 11 serving= more than enough), vegetables, fruit and dairy were divided into three groups (less than 2= insufficient, 2-3= sufficient, more than 3= more than enough). For the age range of 12-18 years, cereal group was divided into three categories (less than 9= insufficient, 9-11= sufficient, and more than 11= more than enough), vegetables and fruit group was divided into three categories (less than 3= insufficient, 3-4= sufficient, and more than 4= more than enough), and meat and dairy group composed three categories (less than 3= insufficient, 3 = sufficient, and more than 3= more than enough). Anthropometric indices, including height-for-age, weight-for-age, and BMI-for-age, were measured according to WHO z-score. Height-for-age was divided into 4 categories, including severe short stature ($z<-3$), short stature ($-3 \leq z \leq -2$), normal stature ($-2 \leq z \leq +3$) and tall stature ($z>3$). The BMI-for-age was divided into six groups, namely ($z<-3$), thin ($-3<z<-2$), normal ($-2<z<+1$), overweight ($+1<z<+2$), fat ($+2<z<+3$), and severe fat ($z>+3$) (17).

The weights were measured by a scale with accuracy of 0.5kg. The students were asked to stand still and straight with both feet in the middle of the scale with minimal clothing, and the researcher stood in front of the scale and registered the exact weight. In order to measure heights, the students stood straight without shoes and hat, and looked forward so that the back of their head, arm, hips, and heels was in contact with a wall where the tape meter was installed on, and the researcher put a ruler on top of the student head and measured his or her height with an accuracy of 0.1 centimeter. After the measurement of the students' height, weight, and MBI, the obtained results were compared with growth curve. The results were recorded in the each students' questionnaire, and the questionnaire were then handed to the parents. After a week, the completed questionnaires were gathered by the head of the school. Data collection lasted 45 days.

SPSS version 20 was used to analyze the data; descriptive statistics including mean, median; standard deviation was used to categorize demographic indices; and binary logistic regression and polynomial regression were used to determine the relationship between awareness and performance with anthropometric index in a significance level of 0.05, and an odds ratio (OR) with a confidence interval (CI) of 65%. Some limitations of the study are as follows: nonattendance of parents in school and completing the questionnaires in home; limited time of sampling; high price of Seca scale; and not to have access to an affordable scale that forced the researcher to use a scale with an accuracy of 500g; not to mention all foods consumed by children and the possibility that the caregiver do not remember all foods consumed by the children and completing the questionnaire with reminding bias.

This study was confirmed by Research Council of Bushehr University of Medical Sciences and

registered by the Ethics Committee of the Vice-Chancellor of Research, Bushehr University of Medical Sciences, Bushehr, Iran. To observe the ethical issues, the researchers took the following steps: The permission of Vice-Chancellor of Research in order to enter the research environment and provision of sufficient explanations for the investigated sites, respondents' voluntary participation in the research, confidentiality of the research, availability of research findings to research units; and grant of educational pamphlet after the final completion of the questionnaires by parents.

Results

The participants in this study were 402 parents, including 143 fathers with a mean age of 38.96±4.79 and 259 mothers with a mean age of 34.6±4.75. The educational level for the majority of the mothers was diploma and associate degree (45.3%) and most of the fathers had bachelor degree or higher (45.3%). Mothers were mostly housewives (76.1%), and total household income for the majority of the families (42%) was 1-2 million Tomans. Most of the families (67.7%) had their own houses and 52.2% of the investigated students (210 individuals) were female. The mean age and standard deviation of the children was 9.66±1.72 .

The awareness of Food security in 89 parents (22.1%) was in an insufficient (weak) level. Table 1 shows the consumption of different food groups in terms of frequency and percentage. The daily consumption of cereal in 283 children (70.4%) was insufficient, while 49.5% of the children (199 individuals) were in the sufficient group regarding meat consumption. The fruits, vegetable, and dairy consumptions of individuals in 67.1%, 48.5%, and 41.3% of cases were more than enough, respectively (Table 2).

Table 1. Frequency of daily consumption of the food groups (parents' performance) and anthropometric indices in children within the age range of 6-13 years

Variable	Consumption rate	Frequency	%
Cereal	insufficient	283	70.4
	sufficient	102	25.4
	More than enough	17	4.2
Meat	insufficient	36	9.0
	sufficient	199	49.5
	More than enough	167	41.5
Fruits	insufficient	48	11.9
	sufficient	106	26.4
	More than enough	248	61.7
Vegetables	insufficient	60	14.9
	sufficient	147	36.6
	More than enough	195	48.5
Dairy	insufficient	75	18.7
	sufficient	161	40.0
	More than enough	166	41.3
Anthropometric Index	**Z Score**	**Frequency**	**%**
Weight-for-age	$z>+3$ (severe obesity)	17	7.3
	$+2<z<+3$ (obesity)	34	14.7
	$+1<z<-2$ (overweight)	41	17.7
	$-2<z<+1$ (normal)	135	58.2
	$-2<z<-3$ (underweight)	4	1.7
	$Z<-3$ (severe underweight)	1	04
Height-for-age	$z>+3$ (severe tall stature)	42	10.4
	$-2<z<+3$ (normal)	355	88.3
	$-2<z<-3$ (short stature)	5	1.2
BMI-for-age	$z>+3$ (severe obesity)	20	5.0
	$+2<z<+3$ (obesity)	53	13.2
	$+1<z<+2$ (overweight)	77	19.2
	$-2<z<+1$ (normal)	217	54.0
	$-2<z<-3$ (thinness)	29	7.2
	$Z<-3$ (severe thinness)	6	1.5

Table 2. Relationship between parents' performance (food groups' consumption) and BMI-for-age index

Variable		Thinness and severe thinness			Overweight			Obesity and severe obesity		
		OR	CI 95%	P-Value	OR	CI 95%	P-Value	OR	CI 95%	P-Value
Cereals	Insufficient	2.10	0.83-5.33	0.11	1.51	0.81-2.80	0.19	1.68	0.88-3.19	0.11
	Sufficient					1				
	More than enough	0.97	0.10-8.85	0.97	1.02	0.25-4.09	0.97	0.77	0.15-3.87	0.75
Meat	Insufficient	1.04	0.32-3.42	0.93	0.54	0.19-1.53	0.24	0.51	0.18-1.45	0.21
	Sufficient					1				
	More than enough	0.83	0.37-1.87	0.63	0.76	0.44-1.31	0.33	0.58	0.33-1.03	0.06
Fruits	Insufficient	0.48	0.12-1.89	0.29	0.59	0.22-1.57	0.29	0.74	0.31-1.77	0.50
	Sufficient					1				
	More than enough	0.68	0.30-1.52	0.35	0.83	0.45-1.53	0.57	0.58	0.32-1.06	0.08
Vegetables	Insufficient	0.81	0.24-2.65	0.72	1.35	0.6-3.02	0.46	1.04	1.04-4.81	0.03
	Sufficient					1				
	More than enough	0.81	0.31-1.73	0.58	1.06	0.6-1.89	0.82	0.59	0.59-1.99	0.78
dairy	Insufficient	0.67	0.24-1.83	0.43	0.97	0.49-1.93	0.94	0.63	0.29-1.83	0.25
	Sufficient					1				
	More than enough	0.53	0.23-1.17	0.12	0.51	0.28-93	0.03	0.66	0.37-1.18	0.16

In terms of height-for-age index, 42 students (10.4%) were tall. The evaluation of the weight-for-age index in 232 cases with the age of 10 years showed that 58.2% of the participants (135 individuals) were in a normal range and in terms of BMI-for-age, 37.4% of the children (150 individuals) had overweight or severe obesity (Table 2).

Binary logistic regression test showed no significant relationship between parents' awareness level (OR= 1.23, P=0.61) and height-for-age index. Polynomial regression test regarding the relationship of parents' awareness level with weight-for-age and BMI-for-age showed no significant relationship between awareness level and weight-for-age index (p>0.05). However, there was a significant relationship between awareness level and BMI-for-age index, so that the chance of undesirable awareness in parents with overweight children was less than 56%, compared to parents with normal children (OR=0.44, P= 0.02). Binary logistic regression showed no significant relationship between parents' performance in all food groups and height-for-age index (P<0.05). Furthermore, polynomial regression showed no significant relationship between parents performance and weight-for-age index (P<0.05).

Regarding the relationship between parents' performance and BMI-for-age index (Table 2), polynomial regression showed the consumption of milk and dairy was significantly higher in overweight children, compared to normal children (OR=0.51, p=0.03). Additionally, vegetable consumption was significantly more in children with obesity or severe obesity in comparison with normal children (OR=1.04, P=0.03).

Implications for Practice

In line with the objectives of the study, the obtained results of this study revealed Food Security awareness was in a desirable level among the majority of the parents. This can be due to their participation in the training courses held at Comprehensive Health Centers. The insufficient consumption of cereal in most of the children and excessive consumption of meat, fruits, vegetables, and dairy in more than half of the children, raises the possibility of parents' unawareness about the standards of food serving despite parents' awareness of Food Security. Furthermore, more than one-third of the children had overweight or severe obesity regarding weight index, and more than one-third of the children had overweight or severe obesity considering the BMI index. Biological, personal, social, and economic factors, as well as other cultural factors, such as nutritional knowledge and behavior, can play a key role in obesity.

There was a chance of undesirable awareness in more than half of the parents with overweight children, compared to those with normal children. It seems that parents' desirable awareness necessarily does not necessarily lead to the changes in their behaviors and performances. With a

change in the lifestyle from traditional to modern, there is an increase in the desire to consume fast foods and junk foods (chips, snacks, and soft drinks) and non-organic juices, and high-calorie products. Meanwhile, there is a need to conduct future studies to calculate the consumed foods in performance questionnaire as well as the possibility of consuming high-calorie snacks.

References

1. Karak P, Maiti R, Das P, Karmakar A. Assessment of nutritional status of school children in rural and urban areas of Bankura, West Bengal. Int J Pharm Sci Res. 2018;9(1):338-45.
2. Herrador Z, Sordo L, Gadisa E, Moreno J, Nieto J, Benito A, et al. Cross-sectional study of malnutrition and associated factors among school aged children in rural and urban settings of Fogera and Libo Kemkem districts, Ethiopia. PLoS One. 2014;9(9):e105880.
3. Mehrabi H, Owhadi A. Investigation of effective factors on food security in Iran. Agric Econ. 2014;8:111-21 (Persian).
4. De Haen H, Klasen S, Qaim M. What do we really know? Metrics for food insecurity and undernutrition. Food Policy. 2011;36(6):760-9.
5. Matheson DM, Varady J, Varady A, Killen JD. Household food security and nutritional status of Hispanic children in the fifth grade. Am J Clin Nutr. 2002;76(1):210-7.
6. Yeganeh S, Motamed N, Najafpour Boushehri S, Pouladi S, Ravanipour M. Mothers' knowledge and attitude toward food security in complementary feeding of 1-2 year old children and its relation with demographic indices. Evid Based Care. 2018;7(4):22-9.
7. Alimoradi Z, Kazemi F, Estaki T, Mirmiran P. Household food security in Iran: systematic review of Iranian articles. Adv Nurs Midwifery. 2015;24(87):63-76 (Persian).
8. Eshraghian MR, Siassi F, Djazayeri A. Obesity and food security in Yazd primary school students. Tehran Univ Med J. 2007;65(7):68-76 (Persian).
9. Keshavarz S, Mirzaei T, Ravari A. Effect of head and face massage on agitation in elderly Alzheimer's disease patients. Evid Based Care. 2018;7(4):46-54.
10. Khan RE, Raza MA. Nutritional status of children in Bangladesh: measuring composite index of anthropometric failure (CIAF) and its determinants. Pak J Commer Soc Sci. 2014;8(1):11-23.
11. Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, et al. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet. 2008;371(9608):243-60.
12. Dehghan A, Ershad Langroudi M, Kamali Sarvestani M, Shahoseini S. Prevalence of malnutrition in students of elementary schools in Larestan city in 2010. J North Khorasan Univ Med Sci. 2011;2(4):25-8 (Persian).
13. Reshadat S. The mothers' knowledge of infant feeding habits in the community oriented health care center of Kermanshah (2003). J Kermanshah Univ Med Sci. 2006;9(4):e81701 (Persian).
14. Soheili Azad AA, Yeghaneh Ghasemi L, Naserkhaki V. Knowledge and practice of women referred to health centers Boroujerd on complementary feeding. Alborz Univ Med J. 2013;2(2):97-102 (Persian).
15. Waltz CF, Strickland OL, Lenz ER. Measurement in nursing and health research. 4th ed. New York: Springer Publishing Company; 2010.
16. Marías YF, Glasauer P. Guidelines for assessing nutrition-related knowledge, attitudes and practices. Rome: Food and Agriculture Organization of the United Nations; 2014.
17. Talachyan E, Bidari A, Barakati S, Allahi AH, Lornezhad HR. Comprehensive guide integrated care healthy children. Qom: Andishe Mandegar Publication; 2015 (Persian).