



## The Impact of Nutrition Education of Parents on Food Choices of Their Children

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### Abstract

**Objective:** This study aimed to determine whether periodically healthy nutrition educations given to parents effect their nutritional knowledge and healthy food choices of all family.

**Materials and Methods:** The study was conducted on 20 parents and their 25 children in a preschool. Parents of children aged between 1 and 6 who agreed to participate in the study were included in the study. Parents were given a total of 180 minutes of education on healthy nutrition in 3 sessions, each of which took around 60 minutes. Food choices and WHO BMI z scores of children were compared before and after education.

**Results:** The effect of all three educations on the BMI of the children was revealed that while children with normal BMI was 8% in the first education, it was 28% at the end of the third education. The comparison of the food consumption records of the children showed that the intake of many nutrients including protein, fiber, polyunsaturated fatty acid, vitamin C, calcium, and iron increased significantly after education. On the other hand, particularly white bread consumption of parents was found to decrease after education sessions, while their vegetable and fruit-herbal tea consumption increased. The effect of the education on eating behavior was evident in males.

**Conclusion:** After the nutrition education, parents were found to make healthy choices for their children even though they did not apply adequately for their own food choices. It is important to provide nutrition education to families with preschool children.

**Keywords:** Nutrition; Nutrition Education; Food Consumption in Children; Nutrition Knowledge Test; Early Childhood; Turkey

### Introduction

Being healthy and productive during adulthood can be possible with an adequate and balanced diet that makes up the basis of healthy life from infancy to childhood and adulthood [1,2]. Irregular nutrition, as well as undernutrition, paves the way for the basis of health risks, and it does not only impact the physical growth but also mental development negatively especially in childhood [3]. In early childhood, which is a critical period for many developmental factors of a child, both ensuring adequate and balanced nutrition of children and having the child adopt well-developed dietary hab-

its is important in preventing undernutrition based problems [4].

While hunger becomes prominent in the nutrition of infants less than one year of age, children in the 1-3 age group need boundaries even though they want to be independent in every respect. Because the care of children in this age group is mostly given at home, parents are responsible for their regular meal habits after one year of age, particularly for food selection and their regular nutrition [1,2].

On the other hand, four to six-year-olds, who insist on making their own decisions and acting on their own, are less dependent

on parental support and can now eat on their own. Children learn basic knowledge, skills, and habits first from their parents at home and then from teachers and friends at school. Although these children are more prone to adapt to the orientation of the parent and teachers, they can still refuse to eat or they can be choosy eaters in order to have a say in their independence. Parents and teachers become a role model with their own eating habits while offering children nutritious and assorted meals properly and providing food service at the right times [5].

Many diseases in adulthood are linked to childhood malnutrition and improper lifestyle habits. Poor dietary habits and improper food selection behaviors (foods high in fat and salt content, low in nutritional value), which are developed and sustained during childhood, cause these behaviors to continue throughout life. Therefore, dietary habits developed during childhood are of great importance in maintaining a healthy and quality life in every stage of life [6].

While children completing preschool period with the support of their families and educators and starting primary school are desired to be more successful during this process, parents and teachers should also be educated and involved in the process [7].

Studies report that the increase in the level of parents' nutrition knowledge makes positive contributions to their children's healthy nutrition and healthy eating habit development and children of families with proper eating habits develop proper eating behaviors [8].

Since early learning in children begins by imitating individuals in the immediate environment, the mother, father, and siblings are the best role models for children in early childhood. The family environment is the most effective environment in the life of the child in the development of many habits like eating habits. Children in this age group develop eating habits by imitating the individuals around them at the family dining table [6,9]. Studies on comprehensive dietary habits of parents and children indicate that the status of parents' vegetable and fruit consumption affect their children and that child take their parents as role models in nutritional matters [10].

Schools are the first social environment where children are not accompanied by their family. In this environment, children find the

opportunity to develop their own knowledge, attitudes, and behaviors by going through some psychological, biological, and cultural changes. Given this entire developmental period, the most important responsibility in preventing the nutrition-related problems in early childhood and having these children develop healthy eating habits falls on the shoulders of teachers and schools after parents [7].

Various socio-cultural and socio-economic factors such as the education status of the family, shortage of parents' time, culture, and religion are known to affect children's food choices [9]. Education, whose requirement for development is indisputable, is a process consisting of knowledge, attitude and behavior stages. Proper completion of this process is possible by appropriate staff, appropriate management of education, and appropriate equipment use. Education at the theoretical level is defined as teaching rather than education. Indeed, education is a dynamic process. Due to the constant change in these conditions, the sustainability of education is necessary for the adaptation of individuals to new situations. In this context, education is a life-long phenomenon. Therefore, nutrition education to be given to adults will undoubtedly bring about significant changes in children's health as well [7,9,11].

For this reason, teachers and families should be in constant collaboration for children's nutrition and this process should also be supported by nutritionists. Mutual communication will help children get accurate information about nutrition, which will let families and teachers support the nutrition of children [12]. This study was planned and conducted to evaluate the reflection of parental nutrition education on their children.

## Materials and Methods

This study was conducted in a special preschool educational institution in Ankara Province. Parents of children aged between 1 and 6 who agreed to participate in the study were included in the study. Baskent University Medical and Health Sciences Research Board approved this study with the approval of 14/90 Ethics Committee on 27.08.2014.

Parents who agreed to participate in the study were given a total of 180 minutes of education on healthy nutrition in 3 sessions, each of which took around 60 minutes. The teaching content included topics such as healthy eating, healthy child nutrition, and frequently asked questions in nutrition. An interactive teaching

methodology was adopted and the sessions were supported with visual material.

### Content of the questionnaires and their implementation

Prior to the first education session, parents were administered three questionnaires, namely "Parental Data Form", "Data Form for Children", and "Questionnaire on Nutritional Habits of Children". The questionnaires aimed to collect information about parents' own demographic characteristics, health status, and the nutritional status of their children. The questionnaires were administered using the face-to-face interview method.

### Implementation of the nutrition knowledge test

The nutrition knowledge test, which includes basic nutrition knowledge, was administered to the parents both before and after each education session.

The topic and content of each education session were different, but the same questions were used in the pre- and post-nutrition knowledge tests. Thus both what parents remembered from the previous education session and the difference in the level of knowledge before and after the education given that day was determined. The application helped determine both the difference between before and after the education and the difference between the two sessions of education. The nutrition knowledge test applied as pre-test and post-test for each education session consisted of 15 questions and the 15th question involved 8 sub-questions. Therefore, the test was evaluated over 22 points including 14 questions plus 8 questions.

### Collecting food consumption records of the parents and their children

In order to determine the nutritional intake and dietary quality of the parents and their children, after each education session, the parents were asked to fill out food consumption records, which were prepared separately for parents and children. During the first education session, the parents were informed about how to fill out the food consumption records. The information given to the parents included detailed information on portions and food consumption records. During informing parents about portions, the parents participating in the study were also shown sample portion sizes from "Food and Nutrient Photo Catalog" [13]. In this way, parents were predicted to be more sensitive when filling out food consumption records. Parents were asked to write food consump-

tion records on the data forms for three consecutive days including one weekend day. In order to evaluate the eating behaviors of children at school, teachers were asked to record the food consumption information of the children on days coinciding the time when food consumption records were kept at home. Thus three-day food consumption records of the parents and children were collected for three consecutive months.

To determine the daily dietary energy intake and the distribution of consumed nutrients according to the nutrient groups, "Computer Aided Nutrition Program, Nutrition Information Systems Software Package (BEBIS, 7.2; License No: 1326000)", which was developed for Turkey, was utilized [14]. For the analysis of daily nutrient consumption of the parents and their children, energy, carbohydrate, protein, fat, water, fiber, polyunsaturated fatty acids, cholesterol, vitamin A,  $\beta$ -carotene, vitamin E, vitamin B1, vitamin B2, vitamin B6, folic acid, vitamin C, sodium, potassium, calcium, magnesium, phosphorus, iron, zinc, fructose, and omega 3 analyses were obtained from the BEBIS software.

### Body mass index calculation of the parents and their children

The height and weight of the parents and their children were measured and BMI values were calculated. The calculated BMI of the parents were evaluated according to the BMI classification of the World Health Organization (WHO) [15].

BMI should be used with caution because it shows variability according to age in children. "WHO Body Mass Index Z-scores for age" were calculated for the children. BMI was evaluated using "WHO Anthro" software in children aged 0 to 5 years and "WHO Anthro Plus" in children aged 5 years and older. Accordingly, z scores are evaluated as underweight for -1 and below; normal between -1 and +1; slightly overweight between +1 and +2; and obese for +2 and above [16].

### Statistical evaluation of the data

First of all, descriptive statistics were presented based on the qualitative and quantitative nature of the data collected in the study. Qualitative variables were expressed as numbers (N) and percentages (%), while quantitative variables were expressed as mean values, standard deviation values (SD), and upper and lower values. The Kolmogorov-Smirnov test was used to determine whether the quantitative data had a normal distribution. The descriptive statistics of the data that were not distributed normally

were presented as median value and inter-quartile range (3<sup>rd</sup> quartile value-1st quartile value). The Wilcoxon Signed-Rank Test was used to compare two periods (before-after) among three different sessions of education, and the Friedman Test was used to compare the three education sessions. SPSS 21.0 (Statistical Package for Social Sciences) statistical software package was used for the statistical evaluation of the data. The significance level was taken as  $p < 0.05$  for the analysis of all hypothesis tests.

### Results

Table 1 shows the changes in the total food consumption amount of children (home and school) during parental nutrition education. After the 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> education sessions, the median values for children's milk and milk product consumption were found to be 520.0 g, 580.0 g, and 600.0 g, respectively. Although

the consumption of milk and milk products increased along with the education, the increase was not found statistically significant ( $p = 0.344$ ). On the other hand, the median values for children's egg consumption in the study were calculated as 50.0 g after the first session, 55.0 g after the second session, and 50.0 g after the third session, and the median value was found to be statistically significant ( $p = 0.007$ ). Cheese consumption of the children during the education was observed to increase and the median values were determined to be 40.0 g after the first session, 50.0 g after the second session, and 60.0 g after the third session ( $p = 0.013$ ). The median values for the red meat consumption of the children were found to be 80.0 g, 90.0 g, and 90.0 g after the sessions respectively; however, the median for meat consumption was not statistically significant ( $p = 0.861$ ).

Food Consumption of the Children	Education			
	1 <sup>st</sup> Session	2 <sup>nd</sup> Session	3 <sup>rd</sup> Session	p
	Median (IQR**)	Median (IQR**)	Median (IQR**)	
Milk and milk products(g)	520.0 (320.0)	580.0 (367.5)	600.0 (370.0)	0.344
Eggs (g)	50.0 (10.0)	55.0 (25.0)	50.0 (15.0)	0.007*
Cheese varieties (g)	40.0 (43.5)	50.0 (21.0)	60.0 (30.0)	0.013*
Red meat (g)	80.0 (100)	90.0(90.0)	90.0 (67.5)	0.861
Poultry (g)	50.0 (35.0)	55.0 (40.0)	50.0 (37.5)	0.158
Fish (g)	0.0 (51.0)	0.0 (100.0)	50.0 (125.0)	0.031*
Cereals (g) – total	172.0 (38.5)	185.0 (65.0)	180.0 (38.0)	0.062
Fruit (g)	345.0 (77.5)	330.0 (110.0)	355.0 (87.5)	0.173
Vegetables (g)	300.0 (135.0)	280.0 (130.0)	320.0 (175.0)	0.853
Legumes (g)	50.0 (47.5)	50.0 (51.5)	50.0 (37.0)	0.611
Nuts, oilseeds (g)	50.0 (52.5.0)	50.0 (37.5)	40.0 (62.5)	0.028*
Cakes, cookies, biscuits (g)	80.0 (115.5)	75.0 (67.0)	80.0 (47.5)	0.208
Vegetable oil (g)	18.0 (15.0)	20.0 (17.0)	30.0 (59.0)	0.005*
Margarine (g)	0.00 (5.5)	0.00 (4.5)	0.00 (2.5)	0.589
Sugar (g)	19.0 (35.5)	17.0 (22.0)	17.0 (18.0)	0.157
* $p \leq 0.05$				
**IQR: Inter Quartile Range				

**Table 1:** Evaluation of the effect of parental nutrition education on the total food consumption (home and school) of the children.

After the 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> sessions, the median values for poultry meat consumption were calculated as 50.0 g, 55.0g, and 50.0 g respectively ( $p = 0.158$ ). The median value for children's fish con-

sumption was 0.0 g after the first and second sessions, whereas it was calculated as 50.0g after the third session ( $p = 0.031$ ). The median value for children's total consumption of cereals was 172.0 g

after the first session, 185.0 g after the second session, and 180.0 g after the third session. The median value of children’s total consumption of cereals in three education sessions was not found statistically significant ( $p = 0.062$ ). As for fruit consumption of the children, the median values were 345.0 g, 330.0 g, and 355.0 g after the sessions respectively ( $p = 0.173$ ). The median of the children’s fruit consumption in three education sessions was not found statistically significant. The median values of children’s vegetable consumption were 300.0 g after the first session, 280.0 g after the second session, and 320.0 g after the third session ( $p = 0.853$ ). The median values for children’s consumption of legumes were calculated as 50.0 g after the first session, 50.0 g after the second session, and 50.0 g after the third session ( $p = 0.611$ ). On the other hand, the median values for children’s consumption of nuts and oilseeds were calculated as 50.0 g after the first session, 50.0 g after the second session, and 40.0 g after the third session ( $p = 0.028$ ). The median values for children’s consumption of cakes, cookies, and biscuits were 80.0 g, 75.0 g, and 80.0 g after the sessions respectively. The median value for the consumption of cakes, cookies, and biscuit varieties was not found statistically significant ( $p = 0.208$ ).

The median values for the vegetable oil consumption of the children were calculated to be 18.0 g after the first session, 20.0 g after the second session, and 30.0 g after the third session. The median vegetable oil consumption of the children was found to be statistically significant in three education sessions ( $p = 0.005$ ). The median value for children’s margarine consumption was found to

be 0.0 g after the first, second, and third education sessions ( $p = 0.589$ ). The median values for children’s sugar consumption were determined to be 19.0 g after the first session, 17.0 g after the second session, and 17.0 g after the third session ( $P = 0.157$ ).

Table 2 presents an evaluation of the effect of nutrition education given to parents on the anthropometric measurements of the children. Friedman Test was employed to analyze whether there was a difference in terms of the medians of the children’s height, body weights, and body mass index values for each of the three sessions of education.

When the effect of nutrition education given to parents on the anthropometric measurements of the children was evaluated, the median values for children’s height were calculated as 110.0 cm after the first session, 111.0 cm after the second session, and 111.0 cm after the third session. The change in the height of the children in the three education sessions was found statistically significant ( $p = 0.000$ ).

After each of the three sessions, the median values for children’s body weight were calculated as 18.0 kg, 18.0, and 18.0 kg, respectively. The difference between the body weights obtained after the three sessions was not statistically significant ( $p = 0.103$ ).

As for the median values of children’s BMI, they were calculated as 16.7, 16.9, and 16.6 respectively. The difference in body mass index values was not found statistically significant ( $p = 0.827$ ).

Anthropometric measurements of the children	1 <sup>st</sup> Session	2 <sup>nd</sup> Session	3 <sup>rd</sup> Session	p
	Median (IQR**)	Median (IQR**)	Median (IQR**)	
Height (cm)	110.0 (18.0)	111.0 (18.0)	111.0 (17.5)	<b>0.000*</b>
Body weight (kg)	18.0 (7.5)	18.0 (8.0)	18.0 (8.0)	0.103
BMI (kg/m <sup>2</sup> )	16.7 (3.0)	16.9 (2.5)	16.6 (2.7)	0.827
* $p \leq 0.05$ **IQR: Inter Quartile Range				

**Table 2:** Evaluation of the effect of parental nutrition education on the anthropometric measurements of the children.

Table 3 shows the evaluation of the effects of parental nutrition education on the BMI classification of the children after each of the three sessions of education. In the first session, there were 3 (12.0%) children who were underweight according to BMI classification,

whereas this number fell to 2 (8.0%) at the end of the third session. While there were 10 (40.0%) children who were classified normal according to their BMI values in the first session, this number increased to 12 (48%) at the end of the third session. There



BMI (kg/m <sup>2</sup> )	1 <sup>st</sup> Session		2 <sup>nd</sup> Session		3 <sup>rd</sup> Session	
	N	%	N	%	N	%
Underweight	3	12.0	2	8.0	2	8.0
Normal	10	40.0	10	40.0	12	48.0
Slightly overweight	7	28.0	8	32.0	7	28.0
Obese	5	20.0	5	20.0	4	16.0

**Table 3:** Evaluation of the effects of parental nutrition education on the BMI classification of the children.

were 5 children (20.0%) who were classified as obese according to their BMI values in the first session, and at the end of the third session, this number was observed to fall to 4 (16.0%).

### Discussion and Conclusion

Nutrition knowledge is one of the most important factors in healthy eating and the right food selection. Studies show that continuous nutrition education given periodically yields positive results in food selection. On the other hand, the 0-6 age period, which is the time when children get acquainted with life, is very important in terms of developing healthy eating habits. Food selection and eating habits are first developed by taking the parents as role models [17].

While 35.0% of the parents participating in the study considered print and visual media reliable in terms of nutrition, 65.0% stated they did not find it reliable in this respect. While 65.0% of the parents said they were interested in news/developments about nutrition, 35.0% stated that they were not attractive. According to TBS 2010 [18], 14.5% of individuals across Turkey were influenced by food and beverage ads while shopping, whereas 85.5% were not affected. In this study, the number of parents who found print and visual media reliable regarding nutrition was found to be greater than Turkey average.

According to the demographic characteristics of the children included in the study, 40.0% were girls and 60.0% were boys. 12.0% of these children were between the ages of 1-3 and 88.0% were aged between 4 and 6.

Studies show that there is a positive relationship between the nutrition knowledge level of the parents and the healthy nutrition of their children [19-21]. For this reason, it is very important for parents to be conscious and to have knowledge about healthy and

balanced nutrition, to provide right and healthy foods to their children, and to have children develop proper nutrition habits.

In a community-based study conducted in 2013, a childhood obesity prevention program which involved a family-focused education program on nutrition was designed. After the interventions, the findings indicated that the obesity rates of the children decreased, the physical activity levels augmented, and the daily television watching time shortened. After the education program, the parents were found to pay more attention to providing healthier food to their children, and positive developments were observed in the nutrition of the children [22]. In a study conducted by Hoolihan, *et al.* [23], the relationship between nutrition knowledge of parents and healthy nutrition of children was investigated. At the end of the study, an increase was found in the healthy food consumption of the children in parallel with the increase in nutrition knowledge of the parents, while unhealthy food preferences such as French fries were observed to decrease. Similarly, in a study conducted in Japan, children were reported to have more healthy nutrition as the education and nutrition knowledge level of parents increased [24]. Similar to the findings of other studies, in this study, the pre-test and post-test results of the parents indicated that the nutrition knowledge of the parents increased and that parallel to this increase, positive changes were observed in the food consumption of children especially at home.

In this study, the number of correct answers that parents gave to nutrition knowledge test questions was compared to each of the three education sessions. All the results obtained from the pre-test and post-test evaluations in terms of mothers, fathers, and overall were found to be statistically significant. This indicated that parents were affected by nutrition education positively, in other words, the education was effective. In a study, the nutritional choices of

children in early childhood were reported to be under the control of their parents and parents with insufficient knowledge about nutrition could not feed their children adequately and in a balanced way [25].

Eating habits that will be used throughout life are developed in the early childhood period between the ages of 1-6. The general nutritional characteristics of preschool children, who can be divided into two groups as 1-3 age group and 4-6 age group, should be given special consideration by parents and their teachers, and children in these periods should be helped to develop right nutrition habits [1,4]. The increase in the knowledge and skills of parents about health will enable parents to prepare a healthy eating and nutrition environment for their children and this will allow healthy nutrition, growth, and development of children [26]. In addition, regular food consumption of the parent is also important. In one study, nutrition behaviors of children were found to be related with mother's regular cooking at home, breakfast pattern, irregular nutrition, over-eating, ready-made food consumption, and eating preferences [27]. In this study, 95% of the parents were found to eat out, and 30% of these parents ate out 1-3 times a week.

Growth monitoring is of great importance in detecting overweight, underweight, low weight, stunted and short height problems. The height by age in children is the best indicator of especially determining chronic malnutrition, while weight by age is considered to be the best indicator of growth monitoring. Body mass index (BMI), in which weight and height are evaluated together, is an important criterion used to determine nutritional status in children [16]. In a study conducted by Yabancı, *et al.* on obesity prevalence and the factors affecting obesity in 375 kindergarten children between the ages of 5-6, over 85% of the children were found to be overweight [23]. In the first measurements obtained at the beginning of this study, the mean body weight of the children was calculated as  $19.3 \pm 4.6$  kg, the mean height was  $106.3 \pm 10.2$  cm, and the mean BMI was  $16.9 \pm 1.9$  kg/m<sup>2</sup>. The median BMI values of these children for each of the three education sessions were 16.7, 16.9, and 16.6 respectively. When children's BMI was evaluated, the children included in the study were found to be in the normal and overweight group.

The concept of body perception involves the fact that individuals' awareness of changes in their bodies and other people's bodies is under the influence of socio-cultural conditions [28]. In a

study analyzing parents' perceptions of their children's weight and height, there were discrepancies between the perception of the parents and the children's actual anthropometric measurements [25]. In their study on 150 children aged between 2 and 14 and their parents, Uludağ, *et al.* [29] reported that 58.7% of the parents' evaluations on the visuals matched true BMI percentiles of the children, while 4.7% perceived their children more obese and 36.7% thinner than their children actually were. In another study (30), only 30% of the parents were reported to evaluate their children's weight correctly. Similarly, Savaşan, *et al.* [31] reported that parents of 70.1% of the children with normal weight, 75.1% of the children with overweight, and 64.9% of the obese children were satisfied with their children's body weight and that they did not see their children as overweight. In another study, children who were overweight at the age of 8 were stated to have increased chances of becoming obese adults in the following years and this was found to increase the risk of chronic diseases in adulthood [32]. In this study, the comparison of parents' evaluation about their children with the values obtained indicated that 56% of the children and parents matched, while 32% of parents evaluated their slightly overweight/overweight child as normal. These proportion differences between studies show that social and cultural values may be influential on body mass perception while indicating the fact that parents should follow their children's growth and development more closely. In this study, the comparison of BMI classification of the children after the three sessions of education indicated that there were 3 underweight (12.0%) children in the first education session, while the number of children who were underweight according to BMI classification at the end of the 3rd session fell to 2 (8.0%). While there were 10 (40.0%) children who were normal according to their BMI values in the first education session, this number increased to 12 (48%) at the end of the third session. There were 12 slightly overweight children (48.0%) according to BMI classification in the first education session; however, this number fell to 11 (44.0%) at the end of the third session. In light of all these evaluations, parents were found to apply what they learned from the nutrition education in their daily life, the effects of healthy nutrition of the children were observed in their BMIs, the number of children in underweight and overweight groups decreased, and the number of children with normal BMI increased after the three education sessions.

In this study, the examination of the pre-test and post-tests indicated that the knowledge scores increased and the difference

between these scores was statistically significant. On the other hand, the comparison of the pretest of the first education session and the pretest of the third education session revealed a decrease in the scores. This decrease was not statistically significant. The evaluation of this finding together with other data indicated that not only did the education have an effect on the level of nutrition knowledge in a short time, but also the education given turned into efficient behaviors.

Given the fact that parents' diets are closely related to their child's dietary patterns, parents have great responsibility especially in the prevention of childhood obesity. Studies report that childhood obesity is a multi-factorial epidemic problem worldwide and is influenced by several etiological factors [33].

In this study, at the end of the educational interventions, parents verbally reported that they were less oppressive towards their children about eating. On the other hand, milk, meat, vegetable consumption of the parents and their children were observed to show an increase in the first, second, and third education sessions.

Thanks to healthy nutrition education given to families, parents are able to make healthy food choices for their children [8]. Studies have shown that nutrition education given to families may not make a rapid change in the dietary habits and behaviors of children, however that regular nutrition knowledge education can help families to develop proper behaviors about healthy nutrition of both themselves and their children [34,35].

It should be kept in mind that children take their parents as a role model in nutrition as well as in the development of all behaviors. Similar to the findings in the literature, in this study, children's consumption of basic food groups such as milk and fruit were observed to increase with an increase in parents' nutritional knowledge levels at the end of the three education sessions given to the parents. This can be explained by the increased attention paid to the child's nutrition due to the increased knowledge level of the parent and also by the changing food preferences of the child by means of taking the parent as a role model. When the food groups consumed by the parents were examined, the total cereal consumption of the parents was found to increase, while the consumption of white bread decreased at the end of the three educational interventions, and the consumption of vegetables and herbal tea consumption increased. These changes were also found to be sta-

tistically significant. Although it is not statistically significant, an increase was observed in the milk, meat, and fruit consumption of parents.

In a family, mothers are known to be the primary person who has one-to-one close communication with the child, who spends more time with the child, and who is responsible for the child's health, social development, and education; therefore the education of women is actually an investment in the future of society [36]. Since the mother's knowledge about nutrition and health affects all members of the family, women's education should be carried out by experts. In addition, incorporating applications and practices in such educational programs and repeating the educational program periodically is thought to create behavioral change in individuals. In this study, considering that the total duration of the education program was less than six months and the program did not involve any practices or applications, although there were no remarkable changes in the food consumption of the parents, a more meaningful relationship is thought to occur between the food consumption of the children and the food consumption of the parents in the long term.

At the end of the educational interventions, in addition to increasing the nutrition knowledge levels of parents, the study was observed to contribute to a positive change in school meals, although it was not enough to ensure adequate and balanced nutrition in schools where children spent most of their daytime. In this study, at the end of the three educational interventions, an increase was also observed in the nutrition knowledge level of the school management that plans the school menu. The school management added more milk to the breakfast menu, and they abolished the junk food days, which they had been organizing once a week.

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