

The implementation and evaluation of a nutrition education programme about Mediterranean diet for adolescents

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Summary. The purpose of this study is to assess the compliance of the dietary habits in adolescents with the Mediterranean diet by detecting their nutrition knowledge levels and to educate the adolescents on the Mediterranean diet. The research was conducted with adolescents aged between 11 and 16 years in Eskişehir Province. The experimental group (n=76) and the control group (n=84) were applied pretest and posttest. The experimental group was educated on the Mediterranean diet by using different teaching methods for a total of 18 hours (8 weeks). The compliance of the nutrition status of adolescents with the Mediterranean diet was assessed using the Mediterranean Diet Quality Index (KIDMED). Before the education, the KIDMED scores of 25.0% of adolescents had been poor (≤ 3 points), 56.6% of them had been medium (4-7 points) and 18.4% of them had been high (≥ 8 points) whereas after the education, the KIDMED score of all the adolescents (100 %) were high (≥ 8 points). In consequence of the education provided to the experimental group, the nutrition knowledge and KIDMED scores of the adolescents increased. It is important to provide individuals with proper nutrition knowledge and habits beginning from their childhood to prevent health problems at later ages.

Key words: Mediterranean Diet Quality Index (KIDMED), Mediterranean diet education, adolescent nutrition

Introduction

Child nutrition takes form according to the social dietary habits. Healthy eating habits adopted since early ages have influence on a healthier lifetime for individuals in the later years (1-4). The fact that the diseases such as cardiovascular diseases, diabetes, colon cancer and even Alzheimer are less common in the countries with coasts to the Mediterranean Sea, has aroused researchers' interests in the dietary habits in these countries. In the studies conducted in recent years, it has been detected that various tumors (prostate, colon cancer etc.) as well as chronic diseases such as diabetes, obesity, childhood asthma and rhinitis are also less common in the regions where this diet is applied and that there is a connection between indi-

viduals' eating habits and frequency of these diseases (5-11). A study conducted in order to determine the impact of olive oil consumption on lipidosis in patients with non-alcoholic fatty liver disease revealed that olive oil may decrease lipidosis (12).

The Mediterranean diet contains plenty of fresh natural foods, especially fruits and vegetables as well as olive oil, fish, hazelnut, peanut, walnut. The basis of the Mediterranean diet, the definition of which was primarily developed by Keys, is composed of vegetable variety and whole-grain foods (13). The essence of this diet includes regular daily activities, consumption of natural and fresh foods as well as avoidance of too much processed food. The consumption of olive oil is particularly the most important element of the diet (14-15). By means of this study, the compliance of the

adolescents' nutrition status with the Mediterranean diet had been assessed according to their nutrition knowledge and then the adolescents were provided with education on nutrition.

Materials and Methods

Objective and procedure

It was examined in what proportion the adolescents' daily nutrition status complies with the Mediterranean diet and whether or not their nutrition knowledge levels and the compliance of their diets with the Mediterranean diet are correlated. The adolescents were provided with an education on the Mediterranean diet and their nutrition knowledge scores and KIDMED scores were assessed before and after the education.

The study was conducted between 9 February 2015 and 18 May 2015 with adolescents aged between 11 and 16, living in Sivrihisar district of Eskişehir province. The target population of the study was the students receiving education in the middle schools in Sivrihisar district (n=1067). The sample included 160 students: 76 students from Ertuğrul Yavuz Gülerce Middle School (experimental group) and 84 students from Dümrek Middle School (control group). The sample number was determined by means of the Sample versus Target Population Table (16). The schools in the sample were determined via the stratified teleological sampling method (17) and assigned as experimental and control groups. The schools of experimental and control groups were chosen from the regions that have the same demographic characteristics. Before it was launched, the study had been approved by the Ministry of National Education. With the decision of Eskişehir provincial National Education Directorate, research approval was obtained (Date: 19 November 2014, No: 5439716). In addition, parents were informed and approved for the research.

Instruments and data collection

In the study, "Two Group Pretest and Posttest Experiment" adaptation of the "Classic Experimental Design" was used. Two different data collection instruments were used in the research. The first one of the

data collection instruments was the information form developed by the researcher. During the preparation of the information form, the relevant resources and questionnaire forms of the research previously done about this subject were referred to. In the form, there are 8 questions for determining the demographic characteristics of the students, 7 questions for their dietary habits.

The other data collection instrument was the Mediterranean Diet Quality Index (KIDMED) which had been developed in order to assess the compliance of kids' daily nutrition status with the Mediterranean diet. The development of the KIDMED index is based on the principles of Mediterranean dietary patterns as well as the factors that undermine it. The index ranged from 0 to 12, and was based on a 16 questions test that could be self-administered or conducted via an interview (pediatrician, dietitian, etc.). Questions denoting a negative connotation with respect to the Mediterranean diet were assigned a value of -1, and those with a positive aspect were scored +1 (18).

According to the KIDMED index (16 questions):
≤8 points shows "optimal" diet quality.
4-7 points "average" (improvement needed).
≥3 points "very low" (diet quality).

Developed by Stefan et al., validity and reliability of KIDMED index was initially used by Köksal, Tek and Pekcan. In addition to the KIDMED index, a nutritional knowledge test developed by the researchers was used to determine the nutritional knowledge of participants. The nutritional knowledge test included 20 questions. Writers were asked to submit a questionnaire form with questions on nutritional knowledge. These questions were scored according to a 5-point Likert-type scale: very important=5 points; considerably important=4 points; important to some extent=3; minimal importance=2 points; not important=1 point. Potential scores ranged from 20 to 100 points. The validity of the nutritional knowledge questions was tested, and found to have a Cronbach's alpha score of 0.844. These forms were also used as pretest and posttest. Knowledge points of the students were evaluated.

In the research, a planned education was implemented and the experimental group was provided with nutrition education. The education, which took place twice a week during the school hours, was completed in

8 weeks. One month after the completion of the education program, the students were given a consolidation education with the same subjects for two hours. The period of education took 18 hours in total. The education program, which had been prepared by the researcher in form of a presentation, was given to adolescents with the assistance of blackboard via computer and projector. The subjects related to the adequate and balanced nutrition, the importance of nutrition in the adolescence period, the healthy and balanced nutrition suggestions of the World Health Organization, the basic rules of a healthy nutrition, the characteristics of the Mediterranean diet and its effects on the health were explained in these slides. The researcher particularly aimed to make the students comprehend the importance of the Mediterranean diet. They emphasized the importance of the Mediterranean dietary pattern in detail.

Of all the teaching methods; discussion, question and answer, and brainstorming methods were administered. Audio-visual materials were used during the education. The students prepared some documents such as banners, leaflets etc. Posters prepared by children were hung on the wall and not pulled down therefrom until the end of research. Moreover, the adolescents organized activities such as writing drama, poems, songs, plays about the Mediterranean diet and during these activities, they consolidated their knowledge.

Data analysis

The data collected as a result of pretest and post-test was evaluated by using the SPSS 21.00 (Statistical Package of the Social Sciences) program and studied with 95% reliance. The relation between the experimental and control groups and their dietary habits was examined with X^2 relation test. The distribution of nutrition and KIDMED scores in the experimental and control groups before and after the education was determined through independent sample t test and their differentiation according to the gender, which is one of the demographic variables, was evaluated.

Results

The demographic characteristics of the participants of the research are shown in Table 1.

Amongst the adolescents who participated in the research; 36.8 % were 8th grade and 60.5% were boys, 22.4% were 11 years old in the experimental group. With regard to the educational level of participants' mothers, the results showed that 68.4 % were elementary school in experimental group. For participants' fathers educational levels were similar to mothers educational level and 61.8% of fathers were primary school graduates.

The table shows that 25.0 % of the adolescents had a very poor diet, 56.6 % had a diet that needed improvement and 18.4.9% followed a diet of optimal quality before education. The KIDMED scores (≥ 8) of all students increased after the education (Table 2).

While, before the education, the number of both boys and girls who received high KIDMED scores (≥ 8) had been low in the experimental group, all adolescents' scores scaled up to high (≥ 8) after the education. This result shows that the students understood the significance of the Mediterranean diet and its effects on health (Table 3). Moreover, there is no difference between KIDMED scores of adolescents according to the educational status of their parents ($p < 0.05$).

There are significant differences between the scores of male students before and after the education for all of the items about nutrition knowledge. While the score obtained after the education for the items "consumption of only the favorite foods, generally eating veal and generally eating lamb" was lower than the one before the education, the score obtained after the education was higher for other items. This result especially shows that the adolescents realized that the red meat consumption should be limited in the Mediterranean diet. There were no statistically significant differences between the scores of female students before and after the education for the items "abundant consumption of fruit, conformity of dietary habits to the age and health and generally eating veal" ($p > 0.05$). While the score obtained after the education for the items "consumption of only favorite foods, generally eating veal and lamb", excluding the items above, was lower than the score before the education, this score was higher for the other items after the education (Table 4).

While there was no statistically significant difference between the nutrition knowledge pretest results

Table 1. Demographic Information

		Experimental Group (n=76)		Control Group (n=84)	
		n	%	n	%
Grade	5	17	22.4	22	26.2
	6	17	22.4	15	17.9
	7	14	18.4	17	20.2
	8	28	36.8	30	35.7
Gender	Boy	46	60.5	48	57.1
	Girl	30	39.5	36	42.9
Age	11	17	22.4	25	29.8
	12	16	21.1	12	14.3
	13	19	25.0	18	21.4
	14	20	26.3	23	27.4
	15-16	4	5.2	6	7.1
Father's educational level	Illiterate/just literate	5	6.6	5	5.9
	Elementary School	47	61.8	26	31.0
	Middle School	18	23.7	25	29.8
	High School or College	6	7.9	28	33.3
Mother's educational level	Illiterate	7	9.2	4	4.8
	Literate	6	7.9	7	8.3
	Elementary School	52	68.4	44	52.4
	Middle School	6	7.9	26	30.9
	High School	5	6.6	3	3.6
Father's occupation	Farmer	58	76.3	52	61.9
	Self-employed	15	19.7	14	16.7
	Civil servant	3	4.0	18	21.4
Mother's occupation	Housewife	76	100.0	84	100.0

Table 2. KIDMED Scores of Adolescents in the Experimental Group (n=76)

KIDMED Score	Before Education		After Education	
	n	%	n	%
	Very poor (≤ 3)	19	25.0	-
Diet needs improvement (4-7)	43	56.6	-	-
Optimal Mediterranean diet (≥ 8)	14	18.4	76	100.0

of the students in the experimental group and those of the control group, there was a significant difference between the posttest results. The average of nutrition

knowledge score posttest results of the experimental group was determined as $\bar{X}=86.42$ while that of the control group was determined as $\bar{X}=74.12$. There is a significant difference between the KIDMED pretest results of the students in the experimental group and those of the students in the control group. The average of KIDMED pretest results of the experimental group was 5.20 while that of the control group was 6.06. There is a significant difference between the KIDMED posttest results of the students in the experimental group and those of the students in the control group. The average of KIDMED posttest results of the experimental group was 11.84 while that of the control group was 5.26 ($p<0.05$). It was observed that

Table 3. Distribution of KIDMED Scores of Adolescents by Gender (n=76)

KIDMED Score	Boy				Girl			
	Before Education		After Education		Before Education		After Education	
	n	%	n	%	n	%	n	%
Very poor (≤ 3)	15	32.6	-	-	4	13.3	-	-
Diet needs improvement (4-7)	20	43.5	-	-	23	76.7	-	-
Optimal Mediterranean diet (≥ 8)	11	23.9	46	100.0	3	10.0	30	100.0

Table 4. Distribution of nutrition knowledge scores of adolescents in the experimental group before and after education according to gender

Nutrition Knowledge	Boy				t	P	Girl			
	Before Education	After Education	t	P			Before Education	After Education	t	P
	$\bar{X} \pm SD$	$\bar{X} \pm SD$					$\bar{X} \pm SD$	$\bar{X} \pm SD$		
Should have adequate nutrition	4.57±0.93	4.98±.15	-2.929	.005*	4.57±.73	4.97±.18	-2.845	.008*		
Should have balanced nutrition	4.24±0.97	4.96±.21	-4.959	.000*	4.23±0.86	4.90±.31	-4.325	.000*		
Consumption of only the favorite foods	3.17±1.32	1.65±.97	6.282	.000*	3.60±1.19	1.53±.86	7.511	.000*		
Abundant consumption of fruit	4.50±0.96	4.80±.40	-2.197	.033*	4.57±0.68	4.60±.50	-.226	.823		
Abundant consumption of vegetable	3.93±1.34	4.72±.46	-3.936	.000*	3.80±1.21	4.57±.50	-3.096	.004*		
No consumption in late hours at night	2.46±1.41	4.65±.48	-10.236	.000*	2.97±1.63	4.80±.48	-5.633	.000*		
Should consume low-fat food	3.54±1.43	4.65±.53	-5.190	.000*	3.73±1.08	4.47±.73	-3.194	.003*		
Chewing the food sufficiently	4.41±0.93	4.76±.43	-2.185	.034*	4.27±0.87	4.73±.52	-2.379	.024*		
Should adopt nutrition habits according to age and health status	4.15±1.15	4.70±.47	-3.012	.004*	4.40±1.04	4.73±.45	-1.624	.115		
Avoiding processed foods containing additives	3.59±1.41	4.78±.42	-5.759	.000*	3.80±1.32	4.80±.41	-3.746	.001*		
Avoiding too much calorie intake	3.26±1.44	4.65±.53	-6.496	.000*	3.90±1.16	4.73±.52	-3.785	.001*		
Should maintain ideal weigh	3.57±1.52	4.76±.48	-5.205	.000*	3.93±1.62	4.77±.43	-2.816	.009*		
Avoiding too much salty foods	3.91±1.33	4.65±.48	-3.417	.001*	4.10±1.16	4.80±.41	-3.034	.005*		
Avoiding high-sugar foods	3.76±1.51	4.72±.46	-4.311	.000*	3.83±1.42	4.80±.41	-3.713	.001*		
Should have three main meals a day	4.00±1.35	4.85±.36	-4.161	.000*	4.07±1.01	4.83±.38	-4.173	.000*		
It is beneficial to consume fish	3.48±1.44	4.63±.53	-5.467	.000*	3.23±1.33	4.53±.73	-4.782	.000*		
It is beneficial to consume chicken	3.52±1.35	4.65±.53	-5.507	.000*	3.43±1.38	4.53±.51	-4.557	.000*		
It is beneficial to consume veal	3.30±1.41	2.04±.63	5.218	.000*	2.50±1.48	2.23±.63	0.869	.392		
It is beneficial to consume mutton	3.87±1.07	2.15±.67	9.523	.000*	3.43±1.45	2.33±.61	3.485	.002*		
Should consume pulpy fibrous products	3.35±1.35	4.72±.50	-7.023	.000*	3.47±1.20	4.67±.48	-5.288	.000		

** $p < 0.05$

Table 5. Comparison of Nutrition Knowledge Scores and KIDMED Scores of adolescents

	Group	n	$\bar{X} \pm SD$	t	p
Nutrition Knowledge Score (Pretest)	Experimental	76	75.08±8.93	-1.487	.139
	Control	84	77.24±9.39		
Nutrition Knowledge Score (Posttest)	Experimental	76	86.42±3.70	8.660	.000*
	Control	84	74.12±11.87		
KIDMED Score (Pretest)	Experimental	76	5.20±2.45	-2.366	.019*
	Control	84	6.06±2.16		
KIDMED Score (Posttest)	Experimental	76	11.84±0.52	22.304	.000*
	Control	84	5.26±2.65		

* $P < 0.05$ **Table 6.** Comparison of Experimental and Control Groups Nutrition Knowledge Scores and KIDMED Scores

Groups		n	$\bar{X} \pm SD$	t	p
Experimental Group	Nutrition Knowledge Score (Pretest)	76	75.08±8.93	-11.579	.000*
	Nutrition Knowledge Score (Posttest)	76	86.42±3.70		
	KIDMED Score (Pretest)	76	5.20±2.45	-23.204	.000*
	KIDMED Score (Posttest)	76	11.84±0.52		
Control Group	Nutrition Knowledge Score (Pretest)	84	77.24±9.39	2.181	.032*
	Nutrition Knowledge Score (Posttest)	84	74.12±11.87		
	KIDMED Score (Pretest)	84	6.06±2.16	2.578	.012*
	KIDMED Score (Posttest)	84	5.26±2.65		

* $P < 0.05$

both the nutrition knowledge scores and KIDMED scores of the experimental group increased following the education and that the education was beneficial to the students (Table 5).

Whereas the nutrition knowledge score of the experimental group was $\bar{X}=75.08$ in the pretest, it was determined as $\bar{X}=86.42$ after the posttest. This difference between the pretest and the posttest is statistically significant ($p < 0.05$). While the KIDMED score of the experimental group was $\bar{X}=5.20$ in the pretest, it increased to $\bar{X}=11.84$ in the posttest and this difference is significant as well ($p < 0.05$). There is also a significant difference between the KIDMED pretest score and posttest score of the control group ($p < 0.05$) (Table 6).

Discussion

Since the 60s', Mediterranean diet has been applied, especially in the olive growing areas of the Mediterranean region. This diet includes consumption of plenty of olive oil, a large quantity of fruits and vegetables, dairy products, especially cheese, meat and meat products in small quantities (21). Turkey has a coast on the Mediterranean Sea and in these regions, this diet is only partially applied. The dietary habits of individuals differ towards central and eastern regions.

Different researches have been conducted on the Mediterranean diet. Among these researchs, Sahinoguz and Sanlier (22) detected that out of 890 adolescents, 464 of whom were boys and 426 of whom were

girls, 17.9% had poor (≤ 3), 59.2% had a mid-quality (4-7) and 22.9% had optimal quality (≥ 8) KIDMED scores. In the study conducted by Philippou et al (23) 23 male and 11 female swimmers ranging from 13 to 19 and their parents were provided with nutrition education. They assessed the influence of education on the nutrition knowledge and its compliance with the Mediterranean diet. Following the study, they observed an increase in the adherence to the Mediterranean diet of the adolescents, whose parents also received the education. The increase in the KIDMED score and the compliance with the Mediterranean diet that had firstly been % 21 (≥ 8) rose to 47 % (≥ 8) after the education, which was stated to be a positive development ($p < 0.01$). In the study conducted by Serra-Majem etc. (18) (2004) in Spain, it was detected that out of the children and adolescents ranging from 2 to 24, 2.9% had (≤ 3), 48.6% had (4-7) and 48.5% had (≥ 8) KIDMED scores. It was detected in our study that the KIDMED scores of 25.0% of the students was very poor (≤ 3), 56.6% was a mid-quality (4-7) and 18.4% was optimal quality (≥ 8). After the education, the KIDMED scores of all the students increased to ≥ 8 (Table 2). Within the scope of our study, it was identified that KIDMED scores of adolescents do not show any differences according to the educational status of their parents ($p < 0.05$). The study carried out by Bawaked etc (24) revealed that there is a significant association between adherence to the Mediterranean diet, gender and parental education status ($p < 0.01$). It was determined that adherence to Mediterranean diet was higher among children of well-educated parents compared to children of parents with elementary school level of education. As pursuant to our study, there is no difference between KIDMED scores of adolescents according to their parents' level of education. This may result from the fact that parents entail a relative low degree of education.

In the study conducted by Serra-Majem etc. (18) (2004) in Spain, out of the boys among the children and adolescents aged between 2 and 24 years, 3.2% had poor (≤ 3), 47.8% whose diets needed to be improved had a mid-quality (4-7) and 49.0% had high (≥ 8) KIDMED scores. However, it was detected that, out of the girls, 2.5% had poor (≤ 3), 49.5% whose diets need to be improved had a mid-quality (4-7) and

47.9% had optimal quality (≥ 8) KIDMED scores. In the study conducted by Kabaran and Gezer (25) in the Turkish Republic of Northern Cyprus, it was determined according to the gender that out of the children and adolescents ranging from 9 to 13, 7.9% of boys and 4.7% of girls had poor (≤ 3), 22.9% of boys and 28.7% of girls had a mid-quality (4-7), 10.0% of boys and 10.0% of girls had high (≥ 8) KIDMED index. The researchers observed that there is no statistically significant difference between the average KIDMED index according to gender and age groups ($p > 0.05$). In the research by Farajian et al., (26) it was detected that out of Greek male kids aged between 10 and 12, 48.4% had poor (≤ 3), 49.3% had a mid-quality (4-7), 51.7% had high (≥ 8) KIDMED scores. They also determined the scores according to the gender as 3.64 ± 2.29 in boys and 3.66 ± 2.24 in girls; therefore, it was observed that there are no significant differences in KIDMED scores according to the gender ($p > 0.05$). In the study in which they examined the compliance of nutrition status of the adolescents in the Southern and Northern Italy with the Mediterranean diet, Noale et al., (27) detected that out of 565 adolescents aged between 12 and 19 years, 38.6% had poor (≤ 3), 47.4% had a mid-quality (4-7) and 14% had optimal quality (≥ 8) KIDMED scores. Moreover, they observed that the adolescents in the Southern Italy have more adherence to the Mediterranean diet. In our study, we assessed that 32.6% of the boys and 13.3% of the girls had very poor (≤ 3) KIDMED scores before the education. It was determined that 43.5% of the boys and 76.7% of the girls should develop their compliance of nutrition status with the Mediterranean diet, which is described as a mid-quality score (4-7). Those who had high (≥ 8) KIDMED scores were determined as 23.9% of the boys and 10.0% of the girls (Table 3). Other studies show resemblance to the KIDMED scores before the education of our study. This result indicates that adolescents need to improve their diet quality. After the education, the KIDMED scores of both girls and boys were observed to be ≥ 8 .

Providing with nutrition education during childhood is important regarding the development of a healthy eating habit in the youngsters (23). A nutrition education was provided by Demirözü (28) in order to increase the nutrition knowledge level of 78 girls doing

sports aged between 8 and 12 and to create permanent behavioral changes. The researcher determined that the average of the points the experimental group had acquired from nutrition knowledge questions in the pretest was $83.5 \pm 10.3\%$ and that of the control group was $81.8 \pm 12.9\%$. The difference between the average of groups was not considered as statistically significant ($p > 0.05$). However, in the posttest, the average of the experimental group ($98.7 \pm 2.9\%$) was found significantly higher than that of the control group ($78.8 \pm 14.4\%$) ($p < 0.001$). In the study in which the nutrition education provided, the elementary school students in Özkonak town of Nevşehir province by Kaplan (29) were analyzed, and it was observed that the average of the students' knowledge scores, which had been 11.532 ± 1.560 before the education, increased to 13.337 ± 0.882 following the education. A statistically significant difference was detected between the education and the knowledge scores averages ($p < 0.001$). According to the study that examined the influence of the nutrition education provided the students in the regional primary boarding school by Keskin (30) on the food consumption, while the average of the nutrition knowledge test score of the experimental group had been 3.10 in the pretest, it reached to 9.05 in the posttest, increasing 5.94 points ($p < 0.001$). In the study conducted with Spanish school children, Serra-Majem et al. (31) assessed that the boys had higher consumptions of milk and dairy products, grain, pastry, legume, fish, red meat, poultry, egg and fruit than girls; that the consumption of vegetable was higher in girls and the consumptions of sugar, dried fruits and nuts were at the same level in boys and girls. Proper nutrition habits may be developed in children by popularizing the sales of fruits, vegetables, dried nuts, milk and dairy products instead of packaged processed foods in school canteens.

The common result of our study and of the other studies is that the nutrition educations provided to the children are effective. The nutrition knowledge scores and KIDMED scores increased significantly after the education with respect to those before the education (Tables 4, 5, 6). All adolescents obtained a KIDMED score of ≥ 8 following the education. However, the difference between girls' nutrition knowledge scores in pre- and after education period is statistically mean-

ingless in three questions ($p > 0.05$). This case gives rise to the thought that girls may have failed to adequately comprehend some points. In the societies lacking adequate and balanced diet, the nutrition problems are inevitable. One of the most important reasons of the inadequate and unbalanced diet in Turkey is considered to be the fact that the individuals are not sufficiently educated on nutrition and that they lack nutrition knowledge (32). There is not any independent course addressing the importance of healthy diet in school programs in Turkey. Currently in Turkish primary schools (1st–8th grade), nutritional programs are still implemented with contributions from and the support of the students' families, without any government support. Food-hour is the time when students eat grab-a-bite food (fruit, fruit juice, milk, ayran, sandwich, etc.) during the 15-min break. While students are eating, they are questioned about food. Other countries that do not possess nutrition courses in their school programs may add a "nutrition" course in their programs and to systematically educate children on healthy and proper nutrition. Because, today, children and adolescents tend to consume fast food, not paying attention to the importance of healthy nutrition. Development of healthy nutrition knowledge and habits will increase the quality of life in individuals and offer them a quality aging.

The studies have shown that the Mediterranean diet has an influence on prevention of many diseases. The adherence to this diet which is based on the dietary habits of the peoples living in the West Anatolian coasts, Prince Islands, Crete and Greece, Southern Spain, France and Italy is asserted to decrease the risks of neurodegenerative diseases (Parkinson and Alzheimer diseases), cardiovascular diseases, metabolic syndrome, cancer (especially colon cancer and breast cancer), type 2 diabetes, obesity, stroke, inflammation, hypertension, intellectual disabilities and depression (27, 33–43). A study conducted with coeliac disease patients revealed that the daily diet of these people had a low adherence to the Mediterranean diet and that it could be beneficial to guide them to follow the Mediterranean diet (44). Liese et al. (45) conducted a research in order to identify the impact of dietary quality and way of nutrition on inflammation that can be observed in youth with Type 1 Dia-

betes. KIDMED scores of youth were also evaluated within the scope of this study. Findings indicated that teens had a KIDMED score between 3-12 and that a healthy way of nutrition leads to the avoidance of inflammation in young, but has not the same impact on youngs suffering from Type 1 Diabetes. Hernandez etc (46) have examined the impact of children's adherence to Mediterranean diet on bone mineral content and bone density. Children's physical activity status was also evaluated within this process. Research results showed that 82.4% of obese children had a low adherence to Mediterranean diet. It has been concluded that a good bone mass can be created through engaging in high or medium level of physical activities and leading a life in adherence to the Mediterranean diet. Another study examining the relationship between Spanish adolescents' adherence to the Mediterranean diet and their academic achievement showed that the Mediterranean diet along with a good quality of sleep have a positive impact on school performance and academic achievement (47).

Comparable to the rest of the world, quality of life in Turkey is affected by factors like obese families, obese children, cardiovascular diseases, Type-2 diabetes, hypertension, psycho-social problems and cancer. The entire population can benefit from a Mediterranean diet and information and education about this diet should be distributed and publicized. For instance, the curriculum's of educational institutions, including kindergartens, should highlight the importance of consuming olive oil, fruits, vegetables and wholegrain cereals; balanced and sufficient nutrition; and of physical activity. The health benefits of a Mediterranean diet are profound enough to warrant inclusion and promotion, for the adoption of healthy eating habits by children. With respect to its contribution to the protection of human health, starting from the children in elementary schools, this diet should be taught to adolescents as well as their parents, and be included in their curriculum so that their awareness can be increased.

Governments at the regional, national and European level should take prioritize raising, producing, transporting and commercializing the foods that constitute the Mediterranean diet: olive oil, fruits and vegetables, fish, cheese and yoghurt, nuts, cereals. Families, also, should take responsibility for making the

healthiest choices when purchasing food for the home, or at a restaurant (17).

Conclusion

Nutrition has an important influence on healthy growth and development as of infancy and on prevention of health problems. Nutrition and dietary habits in children are essential to plan strategies aiming at the improvement of health in long term in the adult population (48-49). If an individual uses his/her knowledge to make behavioral changes, it means that such knowledge is promoting positive behaviors and habits. This study determined the level of nutritional knowledge amongst adolescents, and the extent to which their nutritional habits are in accordance with the Mediterranean Diet Quality Index. In our study, it was observed that the nutrition knowledge of the adolescents increased and that they comprehended the characteristics of the Mediterranean diet following the education on the Mediterranean diet and healthy nutrition. The Mediterranean diet is also considered to set a good example regarding adequate and balanced nutrition. With respect to its contribution to the protection of human health, starting from the children in elementary schools, this diet should be taught to adolescents as well as their parents, and be included in their curriculum so that their awareness can be increased. Proper nutrition habits may be developed in children by popularizing the sales of fruits, vegetables, dried nuts, milk and dairy products instead of packaged processed foods in school canteens. The results of this study have revealed that a systematical nutrition education is efficient and beneficial for the individuals. In order to reform the wrong nutrition habits and increase the knowledge level, it is essential to provide children and adolescents with applied nutrition education at every stage of education starting from pre-school institutions and to sustain this education.

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