Artículo Original

Can dietary fiber knowledge level be a determinant of dietary fiber intake in adolescents? Turkey example

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ABSTRACT

Objective: This study aims to determine the relationship between dietary fiber knowledge level, nutritional status, and dietary fiber in adolescents.

Methods: This research was carried out on 276 adolescents between the ages of 14-17 who studied at the high school level in İnegöl between November 2018 and May 2019 and who voluntarily agreed to participate in the research. A three-stage questionnaire was applied to the participants, and their anthropometric measurements were taken. A dietary fiber knowledge level scale (KADF) was used to determine the level of diet fiber knowledge. Three days of dietary record was taken to determine the nutritional status.

Results: The mean percentage of the adolescents about their level of knowledge about dietary fiber sources (SDF) is 41.0 ± 16.1 (min: 0-max: 100), while the mean percentage of their knowledge about the effects of dietary fiber on health (DFPH) is 63.5 ± 18.1 (min: 0-max: 100). The average of the total score percentage was determined as 52.2 ± 12.3 (min: 18.8-max: 100). Although participants have a high level of knowledge about the health effects of dietary fiber, their awareness of dietary fiber sources is low. The percentage of DFPH scores of female and male adolescents studying in science high school is significantly higher compared to individuals studying in college. There was no statistically significant difference between dietary fiber information levels of adolescents and daily diet, energy, nutrient consumption, and vitamin-mineral intake (p> 0.05). There was no statistically significant difference in dietary fiber information levels and daily dietary fiber consumption of adolescents (p> 0.05).

Conclusion: This is since the level of knowledge is a necessary but not sufficient factor in food selection. As a result, more studies are needed to examine the relationship between dietary fiber knowledge level and dietary fiber intake in adolescents.

INTRODUCTION

Dietary fiber can be defined as a carbohydrate polymer that contains ten or more monomeric units and is not hydrolyzed by endogenous enzymes in the small intestine of the human body[1]. As studies have shown the beneficial effects of dietary fiber on several diseases, such as colon cancer, obesity, and cardiovascular disease, the importance of dietary fiber consumption has increased. In addition, dietary fiber has been shown to affect obesity, blood pressure, hemorrhoids, diarrhea, some bowel disorders, high blood pressure, cardiovascular disease, and immunity[2]. Recommended dietary fiber intakes for children and adolescents vary from 10 to 40 g/day, depending on age, sex, and energy intake[3]. The reports of the UK Individual Nutrition Advisory Committee recommended that the dietary fiber intake for children and adolescents should be 5 g/day for 2-5 years of age, 20 g/day for 5-11 years of age, 25 g/day for 11-16 years of age, and 30 g/day for 16-18 years of age[4].

One factor influencing dietary behavior is nutrition knowledge. Studies have shown that increased nutrition knowledge is associated with healthy dietary behaviors[5,6]. Only con-

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sumers with high levels of knowledge can effectively shop for fiber-rich foods and thus obtain the health benefits that fiber can provide. Low knowledge may be a significant barrier to developing healthy eating habits[7].

According to the data of TUBER 2015, 54.6% of the children and adolescents in the student population in Turkey do not meet an adequate intake of dietary fiber. A study on the knowledge level about dietary fiber in the Turkish student population found that 52.5% of students did not know that dietary fiber should be consumed daily[8]. Many students did not know the food sources of dietary fiber. It is believed that these students could not meet the daily recommendations due to a lack of knowledge[9].

The number of studies on the level of knowledge about dietary fiber in the adolescent population in Turkey is quite limited. The aim of this study was to evaluate the relationship between dietary fiber knowledge level, nutritional status, and fiber intake in adolescents.

MATERIALS AND METHODS

Participants

This cross-sectional study was conducted on 276 adolescents aged 14-17 years living in İnegöl. A face-to-face questionnaire was used, and anthropometric measurements were taken to determine the knowledge level of adolescents about dietary fiber, their daily dietary fiber intake, and whether there is a relationship between the knowledge level and consumption status.

A total of 276 adolescents, 162 girls and 114 boys, who were studying at Mediha Hayri Çelik Science High School, Altın Nesil Schools Anatolian High School, and Doğa College in İnegöl and voluntarily agreed to participate in the study were included in this study between November 2018 and May 2019. The inclusion criteria were as follows: To agree to participate in the study, not to have any chronic disease, and not to take any medication that could affect metabolism. This research was found to be medically ethical by Acıbadem Mehmet Ali Aydınlar University Medical Research Evaluation Board (ATADEK) with decision number 2018-18/23. The participants filled out an informed consent form during the research.

Study Design

The research was conducted in 3 stages. In the first stage, the form of the questionnaire developed by the researcher was applied face-to-face to the people who had agreed to take part in the study. The questionnaire consisted of questions about demographic information in the first part, dietary habits in the second part, and the level of knowledge about dietary fiber in the third part.

The researcher took anthropometric measurements of the participants in the study's second phase. In order to deter-

mine the nutritional status of the participants in the third stage of the study, dietary records were kept for three days. This study was conducted using a questionnaire consisting of 3 stages.

In the first part of the questionnaire, the participants were requested to provide demographic information. In the second part, they were asked questions about their dietary habits; in the third part, they were asked questions about their knowledge of dietary fiber. They were also asked to keep a 3-day food record to determine their nutritional status.

Demographic Information

Participants were asked about their personal information in the first part of the questionnaire. Personal information included age, school attended, gender, number of people in the family, family economic status, parents' educational level, and how they rated their health status.

Determining the nutritional status

The frequency of consumption of morning, noon, and evening meals, eating habits in front of a screen, and eating habits outside were questioned as information about eating habits.

Level of knowledge about dietary fiber

In the third part of the questionnaire, the participants' general level of knowledge about dietary fiber, level of knowledge about the relationship between dietary fiber and health, and level of knowledge about dietary fiber sources were questioned using the KADF scale (82).

Anthropometric measurements

During the anthropometric measurements of the participants, weights were measured with a portable scale with light clothing and without shoes. Height was measured with the back and heels resting on a tape measure attached to the wall, and care was taken to ensure that the distance between the head and neck was 90 degrees in the Frankfurt plane (at the same level above the eye and auricle).

Data Analysis

Body mass index

Body Mass Index (BMI) was calculated with the formula BMI = Body weight (kg) / height (m)2 using the body weight and height of individuals; the obtained BMI values were evaluated according to WHO growth curves. In the evaluation of BMI in children and adolescents, ≥85th-≥95th percentiles are considered mildly obese, and ≥95th percentile is considered obese according to age and gender.

Dietary record

A total of three daily dietary records were obtained from the participants, two on weekdays and one on weekends.

Daily dietary energy and nutrient intakes were analyzed using the Nutrition Information System Program (BEBIS) 7.2. The results obtained were compared with DRI (Dietary Reference Intake) amounts. The daily energy and nutrient intakes recommended for this age group in TUBER, published by the Ministry of Health, General Directorate of Primary Health Care Services, were evaluated according to the level of reliable intake.

Dietary fiber knowledge level

The KADF scale developed by Guine et al. was used to calculate the level of knowledge about dietary fiber[10]. The level of knowledge was grouped according to the percentage scores, which was determined by dividing the score of all participants into 4 quartiles, with the 1st quartile being the 1st group, the 2nd and 3rd quartiles being the 2nd group, and the 4th quartile being the 3rd group. Calculations were made in this way with cut-off scores appropriate to the scores obtained in this study.

Statistical Analysis

The study data were computerized and evaluated using "SPSS (Statistical Package for Social Sciences) for Windows 22.0 (SPSS Inc, Chicago, IL)". Descriptive statistics were presented as mean±standard deviation (minimum-maximum), frequency distribution, and percentage. Pearson Chi-Square Test and Fisher's Exact Test were used to evaluating categorical variables. The conformity of the variables to normal distribution was analyzed using visual (histogram and probability graphs) and analytical methods (Kolmogorov-Smirnov Test/Shapiro-Wilk Test). Kruskall Wallis Test was used to compare three or more independent groups for variables that did not fit the normal distribution. When a significant difference was found, the Mann-Whitney U Test with Bonferroni correction was applied in post-hoc pairwise comparisons for the source of the difference. One-Way Analysis of Variance (One-Way ANOVA) was used as a statistical method between three independent groups for variables that were found to fit the normal distribution. Spearman Correlation Test evaluated the relationship between the variables. The correlation coefficient between 0-0.25 was interpreted as a "weak level," between 0.26-0.50 as a "moderate level," between 0.51-0.75 as a "strong level," and between 0.76-1.00 as a "very strong level." The statistical significance level was accepted as $p<0.05$.

RESULTS

The mean body weight of adolescents was 68.1±12.4 (34-105) kg, the mean height was 167.4±8.2 (150-187) cm, and the mean body mass index (BMI) was 21.7±3.4 (13.4-33.0) kg/m2. According to the classification recommended by the World Health Organization (WHO), 4.7% of the adolescents were underweight, 7.2% were at risk of being underweight, 23.9% were slightly obese, 5.8% were obese, and 58.3% were normal.

The distribution of Dietary Fiber Knowledge Score Percentage and levels of adolescents according to gender is shown in Table 2.

The dietary fiber knowledge scale consists of two subscales and total scores. The first subscale is called the source of dietary fiber (SDF), and the second one is called dietary fiber and promotion of health (DFPH). The mean percentage of the SDF score was 41.0±16.1 (min:0-max:100), the mean percentage of the DFPH score was 63.5±18.1 (min:0-max:100), and the mean percentage of the total score was 52.2±12.3

Table 1. Anthropometric measurements of adolescents

	Total (n=276)	Female (n=162)	Male (n=114)
Age (years)	15.2±0.7 (14-17)	15.1±0.8 (14-17)	15.3±0.7 (14-17)
Body Weight (kg)	68.1±12.4 (34-105)	56.9±9.7 (34-91)	67.0±13.4 (40-105)
Height Length (cm)	167.4±8.2 (150-187)	163.0±5.7 (150-183)	173.7±7.1 (155-187)
BMI (kg/m2)#	21.7±3.4 (13.4-33.0)	21.4±3.2 (13.4-31.5)	222.1±3.7 (13.7-33.0)
Underweight (<3p)	13 (4.7)	7 (4.3)	6 (5.3)
Risk of being underweight (3p-15p)	20 (7.2)	12 (7.4)	8 (7.0)
Normal (15p-85p)	161 (58.3)	103 (63.6)	58 (50.9)
Slightly obese (85p-97p)	66 (23.9)	37 (22.8)	29 (25.4)
Obese (>97p)	16 (5.8)	3 (1.9)	13 (11.4)

n: Number of adolescents; BMI: Body mass index; Categorical variables are presented as "number (column percentage)," continuous variables are presented as "mean±standard deviation (minimum-maximum)"; Source for BMI Classification: Turkey Dietary Guidelines (TÜBER).

Table 2. Distribution of Dietary Fiber Knowledge Score Percentage and Levels of Adolescents by Gender

	Total (n=276)	Female (n=162)	Male (n=114)
SDF Score Percentage	41.0±16.1 (0-100)	40.5±16.6 (6.3-100)	41.6±15.4 (0-81.3)
SDF Level			
Low	65 (23.6)	42 (25.9)	23 (20.2)
Medium	151 (54.7)	83 (51.3)	68 (59.6)
High	60 (21.7)	37 (22.8)	23 (20.2)
DFPH Score Percentage	63.5±18.1 (0-100)	66.9±17.8 (25-100)	58.7±17.4 (0-100)
DFPH Level			
Low	90 (32.6)	45 (27.8)	45 (39.5)
Medium	98 (35.5)	52 (32.1)	46 (40.3)
High	88 (31.9)	65 (40.1)	23 (20.2)
Dietary Fiber Knowledge Score Percentage	52.2±12.3 (18.8-100)	53.7±12.7 (21.9-100)	50.1±11.5 (18.8-81.3)
Dietary Fiber Knowledge Level			
Low	75 (27.2)	40 (24.7)	35 (30.7)
Medium	117 (42.4)	63 (38.9)	54 (47.4)
High	84 (30.4)	59 (36.4)	25 (21.9)

n: Number of adolescents; Categorical variables are presented as "number (column percentage)," continuous variables are presented as "mean±standard deviation (minimum-maximum)"; SDF: Source of dietary fiber; DFPH: Dietary fiber and promotion of health.

(min:18.8-max:100). In addition, 23.6% of adolescents had low knowledge, 54.7% had moderate knowledge, and 21.7% had high knowledge according to SDF. In comparison, 32.6% of adolescents had low knowledge, 35.5% had moderate knowledge, and 31.9% had high knowledge, according to DFPH. According to the total dietary fiber knowledge level score percentage, 27.22% of adolescents had a low, 42.4% had a medium, and 30.4% had a high knowledge level **(Table 2).**

No statistically significant difference was found between the dietary fiber knowledge levels of both male and female adolescents in terms of daily energy consumption and daily water, protein, protein percentage, animal protein, vegetable protein, carbohydrate, carbohydrate percentage, sucrose, fat, fat percentage, PUFA, MUFA, saturated fatty acids, cholesterol, fiber, water-soluble fiber and water-insoluble fiber consumption (p>0.05) (Table 3).

No statistically significant correlation was found between SDF, DFPH, and total dietary fiber knowledge level score percentages and the amount of all macronutrients consumed daily in male adolescents (p>0.05) **(Table 4).**

DISCUSSION

The study evaluated the relationship between dietary fiber knowledge level, nutritional status, and dietary fiber intake in adolescents.

Increased dietary fiber intake is associated with a reduced risk of obesity in children and adults. NHANES 2003-2006 data showed that increasing dietary fiber consumption in children and adolescents aged 2-18 years decreased the risk of obesity and provided a protective effect on impaired glucose metabolism[11]. Turkey Dietary Guidelines (TÜBER) recommends a daily intake of 21 grams of fiber and as little as possible of SFA for male and female adolescents[8]. On the other hand, WHO recommends that less than 10% of total daily energy should come from SFA[12]. TÜBER reported that dietary fiber intake was inadequate in 64.3% of adolescent boys and 57.8% of adolescent girls in Turkey[8]. Similarly, in a study conducted by Yavuz et al. on 933 adolescents, it was found that the daily fiber intake of adolescents was below the recommended level[13]. In a study conducted with 6th-8th grade students in Istanbul, it was determined that 76.6% of them had inadequate fiber intake[14]. In this study, it was determined

Table 3. Distribution of daily macronutrient consumption among adolescents according to their level of dietary fiber knowledge by gender

	Female (n=162)				Male (n=114)			
	Dietary Fiber Knowledge Level			p^a	Dietary Fiber Knowledge Level			p^a
	Low (n=40)	Medium (n=63)	High (n=59)		Low (n=35)	Medium (n=54)	High (n=25)	
	avg±SD (min-max)	avg±SD (min-max)	avg±SD (min-max)		avg±SD (min-max)	avg±SD (min-max)	avg±SD (min-max)	
Energy (kcal)	1764.5±440.8 (1272.5-3843.0)	1825.2±425.2 (1194.7-3751.6)	1733.5±336.7 (1110.0-2677.2)	0.450	2322.8±887.2 (1446.4-6736.5)	2206.2±875.7 (1120.6-7385.1)	2111.3±433.5 (1168.3-3164.3)	0.618
Water (g)	956.5±256.8 (479.2-1966.9)	990.2±280.1 (272.4-2016.7)	957.7±259.0 (502.9-1659.4)	0.825	1157.9±512.8 (579.0-3564.5)	1182.5±396.4 (541.9-2867.6)	1030.1±269.7 (417.3-1487.2)	0.308
Protein (g)	70.6±20.7 (43.3-179.9)	71.2±18.8 (42.1-136.8)	70.6±17.9 (26.6-113.1)	0.966	102.2±44.9 (42.5-267.8)	94.2±45.4 (47.9-318.0)	92.4±24.6 (47.0-150.4)	0.564
Protein (%)	16.5±3.1 (11-25)	16.1±3.1 (10-25)	16.7±3.3 (10-24)	0.421	18.2±5.8 (10-33)	17.5±4.5 (10-31)	18.1±4.0 (11-28)	0.758
Animal Protein (g)	56.1±17.0 (29.7-132.7)	57.7±20.4 (25.5-118.7)	58.2±17.9 (21.6-100.4)	0.654	75.9±35.7 (21.2-180.6)	75.0±39.1 (29.7-273.1)	73.6±21.5 (35.5-119.2)	0.845
Vegetable Protein (g)	14.4±9.1 (0.3-47.2)	13.5±7.6 (1.6-31.1)	12.3±6.6 (0-28.4)	0.603	26.3±29.0 (3.6-158.7)	19.2±13.0 (1.6-75.9)	18.8±12.8 (1.9-60.9)	0.723
Carbohydrate (g)	184.4±55.5 (114.9-435.7)	192.5±58.3 (93.8-422.1)	179.8±41.9 (104.5-306.8)	0.431	234.9±89.0 (123.8-555.1)	246.7±117.1 (111.5-960.0)	224.1±63.5 (99.1-390.2)	0.581
Carbohydrate (%)	42.6±5.6 (32-57)	43.0±7.8 (22-59)	42.6±6.5 (28-61)	0.634	41.4±8.0 (26-59)	45.3±7.2 (29.61)	43.4±7.8 (23-55)	0.082
Sucrose (g)	32.3±20.6 (4.1-95.0)	34.8±21.1 (2.7-118.1)	31.0±21.1 (3.7-107.1)	0.513	37.4±25.2 (3.1-116.9)	35.9±29.6 (2.8-197.9)	34.1±25.2 (4.0-104.3)	0.663
Fat (g)	81.3±22.8 (48.6-148.1)	84.0±23.4 (37.9-165.1)	79.9±20.3 (30.3-135.8)	0.456	106.8±53.7 (63.0-380.7)	91.5±34.7 (51.8-261.4)	92.2±24.2 (38.2-139.8)	0.100
Fat (%)	40.9±5.5 (27-54)	40.8±6.2 (26-56)	40.7±5.5 (24-52)	0.986	40.3±6.8 (30-58)	37.1±5.8 (26-53)	38.5±6.1 (28-49)	0.137
PUFA (g)	16.0±5.8 (7.2-32.3)	16.3±5.8 (6.0-29.6)	15.9±6.0 (4.5-32.2)	0.959	22.1±16.0 (7.5-88.2)	17.8±7.9 (6.3-37.4)	17.7±6.7 (4.6-32.6)	0.705
MUFA (g)	28.8±8.1 (18.2-48.8)	29.5±9.8 (14.4-72.7)	28.6±8.8 (10.1-51.9)	0.823	37.0±19.3 (22.3-136.4)	32.4±14.9 (18.2-107.2)	32.7±9.5 (12.1-50.3)	0.090
Saturated Fatty Acids (g)	30.9±10.2 (18.4-71.9)	32.1±9.4 (14.0-69.3)	29.7±7.7 (11.0-45.3)	0.288	39.9±181 (24.9-128.7)	34.2±14.3 (18.1-115.3)	35.1±9.5 (16.4-53.7)	0.089
Cholesterol (mg)	299.4±122.2 (125.4-691.0)	325.5±182.0 (77.4-1276.1)	314.5±124.0 (64.0-647.4)	0.722	418.9±320.5 (89.4-1720.5)	386.2±262.4 (90.0-1691.4)	389.6±214.9 (91.2-986.2)	0.953
Fiber (g)	18.5±6.1 (10.0-37.7)	17.8±6.8 (7.1-48.7)	16.7±5.5 (6.1-43.2)	0.300	19.9±8.9 (9.1-52.8)	21.9±9.5 (7.3-51.3)	19.3±6.3 (9.2-35.1)	0.406
Water-Insoluble Fiber (g)	11.3±3.7 (4.9-22.2)	10.7±4.3 (5.0-34.0)	10.0±3.5 (4.1-23.9)	0.141	11.8±5.0 (4.6-28.2)	13.0±6.4 (.42-38.3)	11.2±3.1 (5.5-17.9)	0.518
Water-Soluble Fiber (g)	6.4±2.3 (3.1-15.4)	6.2±2.6 (2.3-16.8)	5.6±1.9 (2.2-13.5)	0.162	6.7±3.0 (3.0-17.1)	7.8±3.5 (2.2-19.8)	7.0±2.7 (2.6-15.0)	0.185

n: Number of adolescents; mean: Mean; SD: Standard deviation; MUFA: Monounsaturated fatty acid; PUFA: Polyunsaturated fatty acid; aKruskal-Wallis Test; *p<0.05; **p<0.01.

Table 4. The relationship between dietary fiber knowledge score percentage and daily macronutrient consumption of adolescents according to gender

	Dietary Fiber Knowledge Score Percentage					
	Female (n=162)			Male (n=114)		
	SDF	DFPH	TOTAL	SDF	DFPH	TOTAL
	r	r	r	r	r	r
Energy (kcal)	-0.072	0.072	0.028	-0.015	-0.035	-0.048
Water (g)	-0.032	0.113	0.067	0.057	0.011	0.024
Protein (g)	-0.009	0.121	0.089	-0.062	-0.001	-0.057
Protein (%)	0.056	0.101	0.099	-0.024	0.039	-0.005
Animal Protein (g)	0.011	*0.171**	0.129	-0.021	0.034	0.013
Vegetable Protein (g)	-0.034	-0.075	-0.050	0.005	-0.059	-0.056
Carbohydrate (g)	-0.053	0.002	-0.010	0.030	0.027	0.032
Carbohydrate (%)	0.039	-0.066	-0.019	0.103	0.086	0.122
Sucrose (g)	-0.088	-0.039	-0.065	-0.115	0.031	-0.039
Fat (g)	-0.056	0.073	0.036	-0.038	-0.073	-0.069
Fat (%)	-0.095	0.033	-0.036	-0.046	-0.082	-0.065
PUFA (g)	-0.054	0.036	0.015	-0.060	-0.028	-0.038
MUFA (g)	-0.030	0.067	0.041	0.021	-0.090	-0.045
Saturated Fatty Acids (g)	-0.073	0.045	-0.002	-0.013	-0.048	-0.046
Cholesterol (mg)	-0.006	0.103	0.072	-0.070	0.113	0.045
Fiber (g)	-0.084	-0.007	-0.058	0.022	0.057	0.049
Water-Soluble Fiber (g)	-0.103	-0.033	-0.086	-0.016	0.072	0.031
Water-insoluble fiber (g)	-0.060	-0.045	-0.086	0.057	0.047	0.068

n: Number of adolescents; r: Spearman Correlation Coefficient; *p<0.05; **p<0.01.

that female adolescents could meet 67.6% of their daily fiber requirements, and male adolescents could meet only 54.5% of their daily fiber requirements.

It has been reported that eating habits and food choices are established in childhood or adolescence, and these habits may continue in adulthood[13]. Therefore, it is very important to increase the level of nutritional knowledge of adolescents, to have the right eating habits, and to have a healthy diet. A study conducted in the UK showed that women and individuals with higher levels of education tended to have better nutritional knowledge[15]. In another study conducted in

Switzerland, higher levels of nutritional knowledge were associated with female gender, younger age, and higher education level[16]. In a study in which dietary fiber knowledge levels of 6010 participants from 10 countries were examined, it was found that women generally had a higher level of knowledge about the gender-related health benefits of dietary fiber; higher education corresponded to a higher level of knowledge in relation to educational level; and urban residents had more knowledge than rural residents depending on the living environment[17]. In a study conducted on the knowledge level of students about dietary fiber, it was found that 52.5% of the students were unaware that dietary fiber should

be consumed daily, and many students were unaware of the nutritional sources of dietary fiber. It is believed that these students could not meet the daily recommendations because they did not have sufficient knowledge[8,18]. In our study, 27.2%, 42.4%, 30.4%, and 30.4% of adolescents had low, moderate, and high total dietary fiber knowledge levels, respectively. In this study, the general knowledge level was high in 36.4% of female adolescents and 21.9% of male adolescents. Both SDF and DFPH were higher in females than in males. The fact that females have more knowledge about dietary fiber may be explained by the fact that they are more interested in healthy nutrition because of its effect on body weight and, thus, their self-image[19]. In addition, it has been reported that individuals with a higher level of education will be more sensitive to all kinds of information, including information about protecting body health and having an adequate diet[17]. In a study in which 2536 participants were examined, a significant but weak relationship was found between an increase in dietary fiber knowledge level and an increase in the consumption of foods rich in dietary fiber[17].

In another study conducted on 181 adolescents aged 11-15, knowledge about dietary fiber sources and health properties was associated with the usual consumption of fiber-rich bread and breakfast cereals[20]. In another study conducted on 200 university students in the USA, the extent to which students followed the national dietary guidelines and whether their eating habits were related to their knowledge of the dietary guidelines were examined; it was observed that increased knowledge of fruits, milk, protein, and whole grains was associated with increased likelihood of following dietary guidelines[21]. In a systematic review of 9 studies examining the relationship between nutritional knowledge and dietary intake, it was reported that there was a weak, positive relationship between nutritional knowledge and dietary intake in five of the nine studies[22].

No statistically significant difference was found between the dietary fiber knowledge levels of the adolescents examined in this study in terms of daily energy consumption and daily water, protein, protein percentage, animal protein, vegetable protein, carbohydrate, carbohydrate percentage, sucrose, fat, fat percentage, FFA, FFA, saturated fatty acids, and cholesterol consumption. In addition, no significant difference was found between the participants' dietary fiber knowledge levels and their total fiber, soluble fiber, and insoluble fiber consumption.

Adolescence is the period when lifelong energy and nutrient requirements are at the highest level. It is stated that healthy eating habits acquired during adolescence may affect long-term health status. In this context, it is known that individuals who are overweight in adolescence have an increased risk of being overweight in adulthood. In addition, it is also reported that individuals who have a high-fat diet during adolescence have an increased risk of cardiovascular disease in later years of life, and those who have insufficient calcium intake during this period have an increased risk of osteoporosis in old age. With the transition from childhood to adolescence, the diet quality of individuals gradually decreases, consumption of vegetables, fruits, and milk decreases, and consumption of carbonated beverages increases[23].

In conclusion, educational activities should be organized for adolescents to develop healthy eating behaviors, and this subject should be included in the curriculum and addressed with effective educational methods. In addition, national programs such as healthy canteens, breakfast programs at school, etc., can be implemented in some countries[24].

CONCLUSION

Our study is important because it is the first study to examine the relationship between dietary fiber knowledge level, nutritional status, and dietary fiber intake in the adolescent population. However, there is a need for more work on more participants in this area, using technological infrastructure and online data collection tools.

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