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Assessment of awareness, knowledge levels and consumer perception of students of health high school towards functional foods

Esma Aksoy Kendilci[1], Kenan Kendilci[2], Gulsen Gunes[3]

[1] Bitlis Eren University, Health College, Department of Nutrition and Dietetics, Bitlis, Turkey
[2] Bitlis Eren University, Health Care of Vocational College, Departmen of Health Care Service, Bitlis, Turkey
[3]Inonu University, Faculty of Medicine, Depatment of Public Health, Malatya, Turkey

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Abstract

This study was designed to evaluate consumer perception of students, who were studying in Bitlis Eren University School of Health, regarding functional foods. Study population consisted of 480 students who were attending to Bitlis Eren University School of Health. Of these 74.6% (n = 358) were participated to the study. A Likert-type scale, which was developed by Kopuz (2011) regarding the consumer perception on functional foods, consists of 18 items and is scored between 1-5, was used. 72.1% of the students had no knowledge about functional foods and 69.3% wanted to be informed about functional foods. 30.3% of the students consumed functional food. When the mean score and standard deviations of the 4 subscales for functional foods were examined, the perception regarding the effect on health was 3.204± 0.651, consumption perception was 3.365± 0.643, necessity of use and product prestige perception was 2.600± 0.634, physical quality perception was 3.616±0.644. While the participants' physical quality perception on functional products was observed as "I agree", their perceptions on the effect on health, consumption and necessity of use and product prestige perception were observed as "Undecided" or in other words neither positive nor negative. According to the results of this study, it was observed that the necessity of use and product prestige perception status of the students studying in the school of health about the functional foods was at undecided level.

Keywords: Functional food, perception, health, nutrition

Introduction

Globalization, population growth, commercialization, differentiating life styles arising from urbanization, increased elderly population, product and label claims influenced by changes in food laws, and rapid development of nutrition science have led to differences we see in terms of production and consumption and have provided a basis for changes in health effects expected by consumers from foods and in the field of nutrition [1,2].

In 1991, the Ministry of Health and Welfare started the Food for Specified Health Use (FOSHU) system. This system should help prevent lifestyle-related diseases and reduce their effects, and the foods included in it are equivalent to "functional foods" in Japan. There are more than 800 products with logo of FOSHU in the world. Functional foods promote health by improving wellbeing (mental and physical conditioning) and reducing the risk of diseases. [3,4]. Functional foods considered as the foods of the present day and the future are obtained from completely natural products and supplemented into the foods we consume during daily nutrition. With his statement "Let food be thy medicine and medicine be thy food", Hippocrates (400 BC), the famous philosopher, highlighted the importance of foods for health [5,6].

Functional foods are separated in groups based on their characteristics, content, product class, benefits, and purposes, therefore the products we know with different names may also be included in definition of functional food. Names such as healthy foods, medicinal foods, regulatory foods, foodstuffs intended for special nutritional purposes, and pharmacological foods are also used instead of the term of functional foods [7,8]. There has not been a complete agreement on definition of functional food because all foods are considered as functional food in one sense thanks to their energy contents and nutritional elements. Beyond their basic nutritional functions that require to be consumed as a part of normal diet, functional foods contain components which have potential to promote human health or reduce disease risk. They should be a part of standard food, not a pill or capsule. Besides appeasing hunger and providing essential nutritional elements, functional foods are also effective in increasing mental and physical performance, accelerating growth and development, and enhancing quality of life [9,10].

Today, it is important to know the knowledge levels of consumers about health promoting foods and beverages. According to the

***Coresponding Author:** Esma Aksoy Kendilci, Department of Nutrition and Dietetics, Health College, Bitlis Eren University, Bitlis, Turkey,
E-mail: dyt.e.aksoy@hotmail.com

studies, nine out of every ten people who are consumers of the present day evaluate the product they will buy primarily in terms of health and price and the taste are ranked as the second. The rate of consumers who never care or rarely consider health when choosing product is just about six percent [11]. Companies need to regard basic needs and demands of consumers while planning new products.

Health benefits provided by functional foods can only be ensured by consuming these foods at the correct content and amount. Otherwise, the risk appears for occurrence of nutrition disordersIt is thought that misuse of functional foods or their use under unnecessary circumstances may lead to damage for consumers rather than benefiting. Dieticians, nutritionists, and other healthcare professionals have an important position in terms of reliability. These professionals can inform consumers about benefits of functional foods in certain categories and offer clues and solution offers in order to obtain optimal health via life style change [12,13]. A systematic review study yielded that functional foods are generally accepted by nutritional professionals. However, further study is required into the discrepancies between dieticians and experts in human nutrition regarding the view that it is "dangerous" to consume certain functional foods and regarding their evaluation of whether the public know in which situations certain functional foods should be consumed [14]. Red ginseng is one of the most widely consumed health functional foods, in addition to multivitamin, omega-3, glucosamine and others. The most commonly consumed food is red ginseng, followed by multivitamin, omega-3, glucosamine and aloe in women in the 50's. [15].

The aim of the present study is to determine awareness, knowledge levels, and consumer perceptions of students at Bitlis Eren University Health High School regarding functional foods, thus it was designed to inform and provide guidance for introduction and relevant health benefits of functional foods.

Material and Methods

The present study is a cross-sectional one which was designed in order to determine awareness, knowledge levels, and consumer perceptions of university students regarding functional foods. The population of the study consisted of 480 students who were actively registered to Bitlis Eren University Health High School during the academic year of 2016-2017. Sample was not included. 74.6% (n=358) of the population was reached. The questionnaire which was prepared to be used in the study by utilizing from the literature included 2 parts and 25 questions. There was an information form for determining demographic characteristics of clients in the first part. The second part included questions regarding their knowledge about functional foods, what you think when it comes to functional food, in which way they would want to be informed. Questions like 'Do you have knowledge about functional foods?', 'Which are called as functional food?' were included to determine socio-demographic characteristics in the questionnaire used in the study. A Likert-type scale was used, which was developed by Kopuz (2011), consists of 18 items for consumer perception towards functional foods, is scored between 1 to 5 points. This scale includes 4 subscales. Cronbach's Alpha reliability coefficient of the scale is α= .909. While those having a mean decision between 1-1.49 indicate the lowest level of agreement, 1.50-2.49 low level of agreement, 2.50-3.49 level of indecision, 3.50-4.49 level of positive opinion regarding the decision, and 4.50-5.00 the highest level of agreement. When evaluating the results obtained from the study, SPSS (Statistical Package for Social Sciences) program was used for the statistical analysis. Frequency tables, chi-square, Anova analysis, Independent samples t test, and Tukey test were used for statistical evaluation of the data. Approval was received via decision of Bitlis Eren University Ethics Committee Directorate dated 15.12.2016 and numbered 2016/17-I

Results

Table 1 shows distribution of the students participating in the study in terms of their socio-demographic characteristics. 358 students including 159 female students and 199 male students participated in the study. Mean age of the students was 20.8 ±2.17 and 96.4% were single. When residential areas were examined, 82.1% of the students were living in urban areas. Of the students, 36% was studying at Nutrition and Dietetics Department, 38.3% at Nursing Department, and 25.7% at Social Service Department. When distribution of the students participating in the study was examined by their grades; the rate of those in the first year was 26.8%, the second year was 26.0%, the third year was 22.9%, and the fourth year was 24.3%. Personal monthly income of the students were 400 and lower in 51.7% and 401 -800 in 37.1%.

Table 1. Distribution of the Students Participating in the Study in Terms of Their Socio Demographic Characteristics

		Number (n)	Percentage (%)
Department	Nutrition and dietetics	129	36.0
	Nursing	137	38.3
	Social service	92	25.7
Grade	Year 1	96	26.8
	Year 2	93	26.0
	Year 3	82	22.9
	Year 4	87	24.3
Gender	Female	159	44.4
	Male	199	55.6
Age classification	18 years and younger	28	7.8
	19-20 years	139	38.9
	21-22 years	134	37.4
	23-24 years	48	13.4
	25 years and older	9	2.5
Residential area	Urban	294	82.1
	Rural	64	17.9
Personal average monthly income	400 ₺ and lower	185	51.7
	401-800 ₺	133	37.1
	801-1600 ₺	29	8.1
	1601 ₺ and higher	11	3.1
Total		**358**	**100.0**

When distributions indicating if the students agreed with some factors playing role in protection or promotion of general health. In protection of general health, 87.2% of the students stated that food and nutrition had too much role, 57.8% stated that exercise had too much role, 45.0% stated that family history had a moderate role.

Table 2 shows distributions of the students concerning having functional foods and desire to be informed about them. 72.1% of the students had no knowledge about functional foods. 69.3% of the students wanted to be informed about functional foods. 43.0% of the students wanted to be informed about functional foods mostly with opinions of experts. 42.5% of the students participating in the study considered healthy foods when it came to functional food and 41.3% had no idea about functional foods.

Table 3 shows distribution of the students participating in the study in. terms of consumption of functional foods. 30.3% of the students stated that they consumed functional foods, 46.1% did not consume them, and 23.6% did not know what functional food was. It was determined that 10.9% of the students consumed functional foods 2-3 days a week, 7.32% 2-3 days a week, 3.9% every day, 3.4% 2-3 days a month. 19.6% of the students indicated that they had more control on health as they consumed functional foods. 17.6% of the students reported that they learnt about the presence of functional food via the internet, 14.5% via an expert advice, and 12.6% via TV commercials.

Table 2. Distribution of the Students Participating in the Study to have knowledge about functional foods and desire to be informed about functional foods

		Number (n)	Percentage (%)
Do you have knowledge about functional foods?	Yes	100	27.9
	No	258	72.1
Total		358	100.0
Do you want to be informed about functional foods?	Yes	248	69.3
	No	110	30,7
Total		**358**	**100.0**
In which way do you want to be informed about functional foods at most?	Via opinions of experts	154	43.0
	Via informative essay on newspaper, magazine, etc.	35	9.8
	Via product advertising	29	8.1
	Via internet	13	3.6
	Via information on the package	2	3.4
	Via promotion works	1	0.3
	Via works of tasting taking place in market etc.	6	1.7
Total		**240**	**69.9**
What do you think when it comes to functional food?	Healthy foods	152	42.5
	Dietary products	32	8.9
	Unhealthy foods	26	7.3
	I have no idea	148	41.3
Total		**358**	**100.0**

Table 3. Distribution of the Students Participating in the Study in terms of consumption of functional foods

	Number (n)	Percentage (%)
Do you consume functional foods?		
Yes	108	30.3
No	164	46.1
I don't know what it is.	84	23.6
Do you think that you have more control over your health and have benefits when you consume functional foods?		
Yes	70	19.6
No	6	1.7
I am not sure	32	8.9
Total	108	30.2
How did you learn about presence of functional foods? (you can mark more than one option)		
From the internet	63	17.6
From an expert advice	52	14.5
From Tv Commercials	45	12.6
From food label	32	8.9
From advice of friend, parent, neighbor	30	8.4
Form newspaper, magazine	29	8.1
From tastings in the supermarkets	15	4.2
From shopping malls	13	3.6
From fitness center, cosmetologist	10	2.8

Table 4 shows distribution of the students participating in the study in terms of reasons for not consuming functional foods. As the reasons behind why students did not consume functional foods were examined, primarily 37.4% of them expressed that they did not have enough knowledge, 20.42% preferred organic foods, 15.1% were afraid of side effects, 14.8% were anxious about the presence of artificial additives. When distribution of those, who did not consume functional food, in terms of which circumstances they would consume in, 40.5% stated that they would consume if a doctor or dietician advices, 31.0% if the foods were good for their health problems, 19.3% if certain foods have proven effects, and 12.8% whey they had tendency to a certain disease.

Table 4. Distribution of the Students Participating in the Study in terms of reasons for not consuming functional foods

		Number (n)	Percentage (%)
What is the reason why you Do Not Consume Functional Food? (you can mark more than one option)	I don't have enough knowledge	134	37.4
	I prefer organic foods	73	20.4
	I am afraid of their side effects	54	15.1
	I am anxious about existence of artificial additives	53	14.8
	Not easily accessible, I can't find them in everywhere	47	13.1
	They are not natural	44	12.3
	The opinion about presence of inconsistent information	36	10.1
	They are not beneficial	35	9.8
	it is the new trend	33	9.2
	I have a diet healthy enough	33	9.2
	It doesn't need to be consumed by healthy people	32	8.9
	Expensive	31	8.7
	Harmful	26	7.3
	Not tasty	24	6.7
In which cases do you consume functional foods? (you can mark more than one option)	If it is an advice of doctor or dietician	145	40.5
	If it is good for health problems	111	31.0
	If there are proven effects of certain foods	69	19.3
	When I have a tendency of a certain disease	46	12.8
	If the price is low	34	9.5
	If it is an advice of friend and relative	24	6.7
	I will not buy functional food	11	3.1

As distribution of the students participating in the study was evaluated in terms of the state of knowing functional foods; it was found that while low calorie foods were known as functional food at the highest rate (50.0%), they were known as immune system boosters, as anti aging (physical and mental) by 19.6%, and foods with increased content of omega 3, omega 6, and omega 9 fatty acids as essential fatty acids by 18.7%. Foods that were known the least were ranged as follows; modified margarine products including plant sterols and esters of plant stanols by 9.5%, gluten-free foods by 13.7%, and beverages including plant additives such as Echinacea, gingko, ginseng, and tutsan by 13.7%. The rates of the use of functional foods by the participants were investigated. Those giving the answers of "I frequently use this product" and "I rarely/sometimes use this product" to the questions in the questionnaire were evaluated as they were deliberatively using the product. Functional food which was deliberatively used at the highest rate was carrot with 25.4%, then banana with 24.6%, garlic with 24.0%, mineral water with 23.7%, bitter chocolate with 23.5%, and whole wheat flower with 21.2%. Functional foods with minimum use were ginseng with 4.2%, Echinacea with 4.7%, cornelian cherry with 5.9%, and low energy cheese with 6.1%.

When distribution of the students participating in the study was examined in terms of intended use of functional foods; it was found that 23.5% of the participants answered to be healthy and keep fit, to protect their health as their purpose for using functional foods, 22.3% to be protected from various diseases, 21.5% to increase physical performance, and 18.2% not to require medical treatment. The lowest intended use was stated as "because I like its taste" at the rate of 12.0%.

Table 5 shows distribution of the students' knowledge about functional foods in terms of their socio-demographic characteristics. When students' knowledge about functional foods was examined in terms of age groups; it was found that the rate of the students having knowledge about functional foods increased with increasing age in a statistically significant way ($p<0.05$). There was no a statistically significant difference between the groups as distribution of the state of the students to have knowledge about functional foods was examined in terms of gender and residential area ($p>0.05$). When distribution of students' knowledge about functional foods was examined in terms of their departments; it was observed that 44.2% of the students at Nutrition and dietetics department, 24.8% of nursing students, and 9,8% of the students at social service department had knowledge about functional foods and the difference between the groups was statistically significant ($p<0.05$). When distribution of students' knowledge about functional foods was examined in terms of their grades; 19.8% of the first-year students, 21.5% of the second-year students, 36.6% of the third-year students, and 35.6% of the fourth-year students had knowledge about functional foods and the difference between the groups was statistically significant ($p<0.05$).

Table 6 shows the distribution of the answers given by the students

to the question 'What do you think when it comes to functional food?' in terms of their socio-demographic characteristics. As the distribution of the answers given by the students to the question 'What do you think when it comes to functional food?' was evaluated by their residential place, it was stated that 44.2% of the students living in urban area and 34.9% of the students living in rural area stated that functional foods were healthful foods and the difference between the groups was statistically significant ($p<0.05$).

When distribution of the answers given by the students to the question 'What do you think when it comes to functional food?' was examined by their department, 53.1% of the students studying at nutrition and dietetics department, 38.7% of nursing students, and 33.7% of the students studying at social service department indicated that functional foods were healthy foods and the difference between the groups was statistically significant ($p<0.05$). As distribution of the answers given by the students to the question 'What do you think when it comes to functional food?' was examined by their gender and grade, there was no statistically significant difference between the groups ($p>0.05$).

Table 7 shows distribution of the students' consumption on functional foods in terms of their socio-demographic characteristics. When distribution of the students' consumption on functional foods was examined in terms of their departments; 44.1% of the students studying at nutrition and dietetics department, 26.3% of nursing students, and 17.4% of the students studying at social service department indicated that they consumed functional foods and the difference between the groups was statistically significant ($p<0.05$). As distribution of students' consumption on functional foods was assessed in terms of age, gender, grade, and income; a statistically significant difference was not found between the groups ($p>0.05$).

When means and standard deviations of subscales of functional foods were evaluated in Table 8; it was found that mean scores of the students was 3.204± 0.651 for the perception of the effect on health, 3.365± 0.643 for perception of consumption, 2.600± 0.634 for necessity of use and product prestige perception, and 3.616±0.644 for perception of physical quality. As is seen, while physical quality perception of the participants for functional products revealed as 'I agree', their perception of the effect on health, perception of consumption and necessity of use and product prestige perception was 'Neutral" or in other words neither positive nor negative.

Perception of the students studying at Nutrition and Dietetics Department regarding the necessity of use and perception level of product prestige was significantly higher than Nursing students ($p= 0.011$). Mean scores of perception of the effect on health, the necessity of use, and perception of product prestige for functional food were statistically higher for the first-year students compared to students studying in other years ($p= 0.001$, $p= 0.001$; respectively). The result of independent samples t test revealed that there was no significant difference between the students in subscales of functional foods in terms of gender and residential area ($p> 0.05$).

Table 5. Distribution of the Students' Knowledge about Functional Foods in Terms of their Socio-Demographic Characteristics

	The state of Having Knowledge about Functional Food				
	Yes		No		
Statistics	**Number (n)**	**Percentage (%)****	**Number (n)**	**Percentage (%)****	**Statistics**
Age					
18 years and younger	6	21.4	22	78.6	
19-20 years	30	21.6	109	78.4	p=0.020
21-22 years	50	37.3	84	62.7	
23-24 years	10	20.8	38	79.2	
25 years and older	4	44.4	5	55.6	
Department					
Nutrition and dietetics	57	44.2	44.2	55.8	
Nursing	34	24.8	24.8	75.2	p<0.001
Social service	9	9.8	9.8	90.2	
Grade					
First year	19	19.8	77	77	
Second year	20	21.5	73	73	p=0.014
Third year	30	36.6	52	52	
Fourth year	31	35.6	56	56	
TOTAL	**100**	**27.9**	**258**	**72.1**	

*chi-square ** line percentage

Table 6. Distribution of the Answers Given by the Students to the Question "What do you think when it comes to functional food?" in terms of their Socio-Demographic Characteristics

	What do you think when it comes to functional food?								
Characteristics	**Number (n)**	**Percentage (%)****	**Number (n)**	**Percentage (%)****	**Number (n)**	**Percentage (%)****	**Number (n)**	**Percentage (%)****	
Gender									
Male	64	40.5	18	11.4	11	7.0	65	41.1	p=0.534
Female	88	44.2	14	7.0	15	7.5	82	41.2	
Residential area									
Urban	130	44.2	20	6.8	20	6.8	124	42.2	p=0.014
Rural	22	4.9	12	19.0	6	9.5	23	36.5	
Department									
Nutrition and dietetics	68	53.1	15	11.7	9	7.0	36	28.1	p<0.001
Nursing	53	38.7	14	10.2	14	10.2	56	40.9	
Social service	31	33.7	3	3.3	3	3.3	55	59.8	
Grade									
Year 1	36	37.5	7	7.3	7	7.3	46	47.9	
Year 2	33	35.5	13	14.0	9	9.7	38	40.9	p=0.084
Year 3	39	48.1	9	11.1	7	8.6	26	32.1	
Year 4	44	50.6	3	3.4	3	3.4	37	42.5	

*chi-square ** line percentage

Table 7. Distribution of Students' Consumption on Functional Foods in Terms of their Socio-Demographic Characteristics

	Consumption of Functional Foods						Statistics
Characteristics	**Yes**		**No**		**I don't know what it is**		
	Number (n)	**Percentage (%)****	**Number (n)**	**Percentage (%)****	**Number (n)**	**Percentage (%)****	
Age							
18 years and	5	17.9	17	60.7	6	21.4	
younger	40	29.0	69	50.0	29	21.0	
19-20 years	45	33.8	56	42.1	32	24.1	p=0.468
21-22 years	14	29.2	20	41.7	14	29.2	
23-24 years	4	44.4	2	22.2	3	33.3	
25 years and older							
Gender	48	30.4	70	44.3	40	25.3	
Male	60	30.3	94	47.5	44	22.2	p=0.760
Female							
Residential area	93		132	44.9	69	23.5	
Urban	15	31.6	32	51.6	15	24.2	p=0.485
Rural		24.2					
Department							
Nutrition and	56	44.1	48	37.8	23	18.1	
dietetics	36	26.3	76	55.5	25	18.2	p<0.001
Nursing	16	17.4	40	43.5	36	39.1	
Social service							
Grade							
Year 1	24	25.0	47	49.0	25	26.0	
Year 2	29	31.5	41	44.6	22	23.9	p=0.446
Year 3	26	32.1	42	51.9	13	16.0	
Year 4	29	33.3	34	39.1	24	27.6	
Income	55	29.9	92	50.0	37	20.1	
400 ₺ and lower	43	32.6	56	42.4	33	25.0	
401-800 ₺	5	17.2	13	44.8	11	37.9	p=0.224
801-1600 ₺	5	45.5	3	27.3	3	27.3	
1601 ₺ and higher							
TOTAL	**108**	**30.3**	**164**	**46.1**		**84**	**23.6**

*chi-square ** line percentage

Table 8. The levels of Functional Foods regarding general perception subscales

	Perception of effect on health	Perception on consumption	Necessity of use, perception on product prestige	Perception on physical quality
Mean	3.204	3.365	2.600	3.616
Standard deviation	0.651	0.643	0.634	0.644

Discussion

In the present study, 87.2% of the students stated that the food and nutrition had a great role, 57.8% stated that exercise had a great role, 45.0% stated that the family history had a moderate role in the protection of general health. Similar to the present study; in the study conducted by Kandıralı in 2014 to determine functional food awareness, knowledge levels and usage status of 20-65 year-old clients applying to nutrition counseling, 85.7% of the participants expressed that food and nutrition had a great role, 57.1% said that exercise had a great role, 52.9% stated that family history had a great role in protecting general health (1).

In the present study, 72.1% of the students had no knowledge about functional foods. In a study conducted by Dölekoğlu et al., with adults, only 4.6% of the respondents reported that they know the meaning of functional foods (6). In the study conducted by Kandıralı in 2014, the rate of the participants who heard about the term of functional food before was 8.6%. About 30% of them never heard about it before, 61.4% answered that "I am not sure" (1). According to the results of the study conducted by Hacıoğlu and Kurt in 2012 with academicians to find out the awareness, acceptance and attitudes of consumers about the functional foods, 60% of the participants stated that they never heard about functional foods before (16). The results of these three studies indicated that the rate of those having knowledge about functional foods was very low, which is similar to the present study.

In the present study, 69.3% of the students want to be informed about functional foods. In the study conducted by Kopuz in 2011, it was concluded that 84.6% of the consumers wanted to be informed (5).

In the present study, 46.1% of the students stated that they consumed functional food, 30.3% of them did not consume it, and 23.6% stated that they did not know the meaning of functional food. In the study by Sevilmiş, the rate of the functional food consumers among the participants was 73%; whereas, the rate of those who did not consume was 27% (3). Unlike the present study, the rate of those consuming functional food was found to be slightly higher. Similar to the present study, in the study conducted by Kopuz in 2011, it was stated that 73.2% of the respondents who constituted the majority of the participants consumed functional food (5).

Similar to the present study, in the study conducted by Özkan-Özdemir, Fettahlıoğlu and Topoyan in 2009 to investigate the consumer attitudes towards functional food products, it was revealed that 46.9% of the participants previously used functional food (13).

In the present study, it was determined that 10.9% of the students consumed functional foods 2-3 days a week, 7.3% consumed them 1 day a week, 3.9% consumed every day, and 3.4% of them consumed functional foods 2-3 days a month. Consumption frequency rate of the participants in the study by Sevilmiş was found to be high unlike the present study, it was found that 14.8% of them consumed functional products every day, 29.5% consumed them two three times a week, and 19.7% consumed them once a week.

In the present study, 17.6% of the students stated that they learned the presence of functional foods from the internet, 14.5% learned them with the expert opinion and 12.6% of the learned them from TV commercials. In the study conducted by Sevilmiş in 2008, 32% of the consumers stated that they became aware of functional products with the television commercials, 28% became aware of them by seeing them at the market they do shopping, and 16% stated that they learnt about functional foods with through written advertisements in newspapers, magazines etc. (3). The results of this study were not found to be similar to the present study.

Unlike the present study; in the study conducted by Kandıralı in 2014, in response to the question of how you became aware of the existence of functional foods, 61.4% answered as the expert opinion, 42.9% TV commercials, and 35.7% newspapers and magazines (5).

In their study, Özkan-Özdemir, Fettahlıoğlu and Topoyan (2009) showed that the most important references on functional food products were the acquaintances and friends(13).

In the study by Dölekoğlu et al., (2014), a positive correlation was found between functional food purchases of the participating women and their trust on the expert opinions in the visual media (7). Similarly, in the present study, the majority of the students (61.4%) got information about functional foods with the expert opinion.

In the present study, when the reasons behind why students did not consume functional food were examined, firstly 37.4% expressed that they did not have enough knowledge, 20.4% preferred organic food, 15.1% said that they were afraid of their side effects, and 14.8% expressed that they were anxious about the artificial additives. Unlike the results of the present study, in the study conducted by Sevilmiş in 2008, the main reasons of not consuming these products are thinking that they already consume health products, that it is not necessary for a healthy person, and not believing that such products are useful (3).

When the distribution of the students participating in the present study in terms of their purpose of using functional foods was examined, the participants gave the responses for their purposes of using functional foods as; 23.5% responded as being healthy

and fit and protecting health at the first rank, 22.3% responded as protection from various diseases, 21.5% as increasing their physical performance, and 18.2% as not requiring medical treatment. The least usage purpose was given by 12.0% as enjoying their taste. In the study conducted by Sevilmiş in 2008, when the reasons of the participants for consuming functional products were examined, it was observed that the primary reason was that they were good for health, the second reason was that their taste was enjoyed and the third reason was the opinion that these products had good quality similar to the present study (3). In the study conducted by Kandıralı in 2014, the participants gave the responses for their purpose of using functional food as being healthy and fit and protect my health at the rate of 74.3%, protection from various diseases at the rate of 65.7%, advice of a doctor or a dietician at the rate of 60.0%, increasing physical performance at the rate of 51.4%, and delaying aging and not needing medical treatment at the rate of 41.4%. The least usage purpose was given as improving the state of mind. In the study conducted by Barcellos and Lionello in 2011 with the participation of 450 people in Porto Alegre in South Brazil for the purpose of comparing the consumers' needs with the market supply of the local food companies and investigating the consumers' attitude, intention and motivation about purchasing functional food; the causes affecting the daily functional food consumption were detected as maintaining a healthy lifestyle and improving health, reducing heart diseases and cholesterol, having a healthy digestive system, improving health status, increasing mental and physical performance, preventing diseases, habits and traditions, improving physical appearance, and controlling appetite and weight, respectively (17). The results of these two studies support the results of the present study.

Conclusions

The present study evaluated awareness, knowledge levels, and frequency of consumption in 358 students from Bitlis Eren University Health High School regarding functional foods and the following results were obtained.

1. Generally, consciousness regarding the role of food and nutrition factor in health protection or promotion is considerably high. While 87.2% of the participants thought that food and nutrition had a substantial role, 12.3% thought it had a moderate role, and only two people indicated it had a minor role.
2. The rate of the students having knowledge about functional foods was 27.9%, which was quite low. 72.1% of the students did not have knowledge about functional foods.
3. 69.3% of the students wanted to be informed about functional foods.
4. 43.0% of the students wanted to be informed about functional foods with opinions of experts at most.
5. When it came to functional foods, 42.5% of the students participating in the study thought that they were healthy foods and 41.3% expressed that they had no idea about functional foods.
6. As the reasons behind why the students did not consume functional foods were examined, primarily 37.4% of them expressed that they did not have enough knowledge, 20.42% preferred organic foods, 15.1% were afraid of side effects, and 14.8% were anxious about the presence of artificial additives.
7. As distribution of those who did not consume functional food was examined regarding in which circumstances they would consume, 40.5% stated that they would consume upon an advice of doctor or dietician, 31.0% if the foods were good for their health, 19.3% if certain foods have proven effects, and 12.8% whey they had tendency to a certain disease.
8. 30.3% of the students stated they consumed functional foods, 46.1% did not, and 23.6% had no information about what functional food was.
9. While 23.5% of the participants answered to be healthy and keep fit and to protect their health as purposes for using functional foods, 22.3% answered to be protected from various diseases, 21.5% to improve physical performance, and 18.2% not to require medical treatment. The lowest intended use was stated as "because I like its taste" at the rate of 12.0%.
10. When the state of students to have knowledge about functional foods was evaluated in terms of age groups, the rate of students having knowledge about functional foods statistically significant increased with increasing age ($p<0.05$).
11. When the distribution of the students' knowledge about functional foods was examined in terms of their departments; 44.2% of the students studying at Nutrition and dietetics department, 24.8% of nursing students, and 9.8% of the students studying at social service department were observed to have knowledge about functional foods and the difference between the groups was statistically significant ($p<0.05$).
12. When distribution of students' knowledge about functional foods was examined in terms of their grades; 19.8% of the first-year students, 21.5% of the second-year students, 36.6% of the third year students, and 35.6% of the fourth-year students had knowledge about functional foods and the difference between groups was statistically significant ($p<0.05$).
13. When distribution of the answers given by the students to the question 'What do you think when it comes to functional food?' was examined in terms of their residential place, it was found that 44.2% of the students living in urban area and 34.9% of the students living in rural area stated that functional foods were healthy foods and the difference between the groups was statistically significant ($p<0.05$).
14. When distribution of the answers given by students to the question 'What do you think when it comes to functional food?' was examined in terms of their department; 53.1% of the students studying at nutrition and dietetics department, 38.7% of nursing students, and 33.7% of the students studying at social service department stated that functional foods were healthy foods and the difference between the groups was statistically significant ($p<0.05$).
15. When the students' consumption on functional foods was examined in terms of their departments, 44.1% of the students studying at nutrition and dietetics department, 26.3% of nursing students, and 17.4% of the students studying at social service department stated that they consumed functional foods and the difference between the groups was statistically significant ($p<0.05$).
16. When means and standard deviations of subscales for functional foods were examined in Table 13, it was found that mean scores of the students was 3.204± 0.651 for the perception of the effect on health, 3.365± 0.643 for perception of consumption, 2.600± 0.634 for necessity of use and product prestige perception, and 3.616±0.644 for perception of

physical quality. As is seen, while physical quality perception of the participants for functional products revealed as 'I agree', their perception of the effect on health, perception of consumption and necessity of use and product prestige perception was 'Neutral" or in other words neither positive nor negative.

17. Perception of the students studying at Nutrition and Dietetics department regarding level of the necessity of use and product prestige perception of functional foods was significantly higher than Nursing students (p= 0.011). Mean scores of the participants for perception of the effect on health and the necessity of use and product prestige perception was statistically higher for the first-year students compared to students in other years (p= 0.001, p= 0.001; respectively). The result of independent samples t test revealed that there was no significant difference between the students in subscales of functional foods in terms of gender and residential area (p> 0.05).

Recommendation

According to results of the present study, university students need to be informed about functional foods. Knowledge levels of the students studying at Nutrition and Dietetics department were found to be higher than students at the other departments, because they receive the course of functional foods in their curriculum and it is a subject associated with their field. Health high school students regarding perception of effect on health, perception of consumption, and necessity of consumption and use and product prestige perception related to functional foods were observed to be neutral. Perception of the students studying at Nutrition and Dietetics department was higher than students at the other departments, because they receive the course of functional foods in their curriculum and it is a subject associated with their field. To raise the awareness, elective courses on functional foods can be added for all students in general or functional foods may be introduced by experts conducting seminars.

According to the World Health Organization, the world has been feeding unhealthily day by day and this leads life time to get shorter and quality of life to gradually decrease. In addition, malnutrition is one of the important factors among diseases resulting in death. The food we eat and drink may influence our life expectancy or quality of life. However, it should be absolutely remembered that functional foods are not miraculous food, these products help to maintain well being; but they cannot eliminate the problems caused by unhealthy diet. The concept of functional food has known better today and the number and diversity of commercial products have been increasing every day. Functional foods that are prepared by addition of bioactive components derived from natural food elements and plants are known not to have a negative effect in terms of health. Functional foods need to be consumed with an adequate and balanced diet including various nutrients to utilize their beneficial effects on our health.

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