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An evaluation of food labeling attitude, preferences, and knowledge for nutrition consultancy

Una evaluación de la actitud, las preferencias y el conocimiento sobre el etiquetado de alimentos para la consultoría nutricional

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Abstract

The aim of the study was to determine the knowledge, attitudes, and preferences of individuals towards food labels according to their nutrition consultancy. The study was performed as a survey model, and a total of 580 participants were sampled in two groups according to their nutrition counseling on adults, private nutrition and diet counseling centers in Konya, Turkey. The data were collected by obtaining a face-to-face interview method, consisting of five parts. Food label reading according to the duration of counseling differed ($p<0.05$). According to nutrition counseling, due to the food label reading levels of participant's difference was determined in dairy products, canned foods and tomato paste, meat products ($p<0.05$). The expiration date, food label reading, and amount of fat and sugar were found to be high in the nutrition counseling group. The nutrition knowledge scores ($\bar{x}\pm SE$) were determined as 75.1±0.7 and a difference was obtained in gender, BMI, education level, nutrition counseling, and food label reading ($p<0.05$). Significant results were revealed between food label reading and nutrition counseling, and it is predicted that increasing awareness of nutrition consultancy centers related to reading food labels.

Keywords: *food label; nutrition consultancy; food preferences.*

Resumen

El objetivo del estudio fue determinar los conocimientos, actitudes y preferencias de los individuos hacia las etiquetas de los alimentos según su consulta de nutrición. El estudio se realizó como un modelo de encuesta, y se muestreó un total de 580 participantes en dos grupos según su asesoramiento nutricional en adultos, centros privados de asesoramiento nutricional y dietético en Konya, Turquía. Los datos fueron recolectados mediante la obtención de un método de entrevista cara a cara, que consta de cinco partes. La lectura de las etiquetas de los alimentos según la duración de la consejería difirió ($p<0,05$). De acuerdo con el asesoramiento nutricional, debido a los niveles de lectura de las etiquetas de los alimentos de los participantes, se determinó diferencia en productos lácteos, alimentos enlatados y pasta de tomate, productos cárnicos ($p<0,05$). Se encontró que la fecha de caducidad, la lectura de la etiqueta de los alimentos y la cantidad de grasa y azúcar eran altas en el grupo de asesoramiento nutricional. Los puntajes de conocimiento de nutrición ($\bar{x}\pm DE$) se determinaron como 75,1±0,7 y se obtuvo una diferencia en género, IMC, nivel educativo, asesoramiento nutricional y lectura de etiquetas de alimentos ($p<0,05$). Se han revelado resultados significativos entre la lectura de las etiquetas de los alimentos y el asesoramiento nutricional, y se prevé que aumente la concienciación de los centros de asesoramiento nutricional relacionados con la lectura de las etiquetas de los alimentos.

Palabras clave: *etiqueta de los alimentos; consultoría de nutrición; preferencias de alimentos.*

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Introduction

It is well known that a balanced and healthy diet can significantly contribute to the prevention of some chronic diseases associated with obesity[1]. Today, the benefits of food labels are accepted as an important component among the factors used in the fight against nutrition-related diseases that can be seen in the society. Food labels are a very important resource for consumers to obtain nutritional and health-related information about food products[2]. Food labels provide the consumer with information about the product, making it easier to identify and choose healthy foods that are rich in nutrients and low in energy, and affect their food purchasing behavior and decisions[3-6]. A correct food labeling scheme should meet all the goals and objectives of the society's health problems, nutrients, adequate and balanced nutrition[7,8]. To achieve these goals and objectives, food labels must be easily understood, updated in visual and written form, and reflect the developments in nutrition and health[9,10].

Today, due to the increasing variety and marketing of packaged and ready-to-eat foods, the role of the dietitian in assisting the public in making healthy food choices has become increasingly important[11,12]. Nutrition education and behavior change are widely used for the individuals to choose the right and healthy food. Individuals who receive counseling by dietitians are more interested in diet, food selection and nutrition[13]. It will also be possible to prevent wrong and unhealthy food selection by developing label reading behavior with counseling service. Revealing the effects of nutritional counseling on the status and preferences of individuals regarding food labels will have beneficial effects on individuals' label reading and healthy eating[14]. Health professionals play a vital role in ensuing nutrition information and knowledge on food labels to understand the consumers. The dieticians' knowledge not only has focused on purchasing foods, healthy food choices or diet, and disease but also food labeling. In this study, determination of the food labeling knowledge, attitudes, and preferences of adults in Konya, according to nutritional consultancy was aimed.

Methodology

The research was designed as a relational survey model, and the data were made through face-to-face interviews by using a questionnaire. The population consists of 18-65 aged adults living in Konya. In calculating the sample size, the parameters for the G*Power 3.1.9.2 program were determined as 0.30 for the effect size, 0.05 for the margin of error (α), and 0.95 for the power ($1-\beta$)[15].

According to the simple random sampling method was planned as two groups as those who received nutrition counseling and those who did not, and the sample size was calculated as 580, with 290 participants in each group. The data of the participants who received nutrition counseling were obtained from private nutrition counseling centers located in Konya on a voluntary and consent basis. Voluntary institutions in the selection of nutrition counseling centers from the central districts were included in the study and the consent of the institution officials was obtained. The research was found ethically appropriate with the decision numbered 2019/74 by the Non-Interventional Clinical Research Ethics Committee of the Faculty of Health Sciences of Selcuk University.

The data were obtained in the form of a face-to-face interview with a questionnaire. The questionnaire was prepared independently of the authors by 3 experts with academic positions in Nutrition and Dietetics, and it was applied to a group of 20 people before the study, and it was applied in the sample by making the necessary corrections and trying to establish the content validity. The questionnaire consists of five parts. In the first part socio-demographic information and anthropometric measurements (e.g., height, body weight) taken by the dietitian. Body Mass Index (BMI) (kg/m^2) values were obtained by using body weight (kg) and height (m). The BMI values of the participants were used in the classification prescribed by the World Health Organization (WHO)[16]. The duration of consultancy and the status and preferences of the service was in the second part. In the third section, there are situations such as the frequency of reading the food label, accessing the information with the food label, and the factors that are affected when purchasing foods. The furth

chapter, consists of the purpose of use of food labels reflecting consumer attitudes in reading food labels, the situation and preferences for food labels, the food label order in our country, etc. with 40 attitude statements. Participants were answered to make a 5-point Likert-type scale (1. Strongly disagree, 2. Disagree, 3. Undecided, 4. Agree, 5. Strongly agree) to determine the levels for each attitude statement. In the fifth part of the questionnaire, a closed-ended knowledge test with 40 questions prepared to measure the nutritional knowledge level of the participants. Knowledge test questions are healthy eating behaviors, food purchasing behaviors, and nutrients related to food labeling. Turkey Dietary Guide (TDG)[17] was used to form the knowledge test. The scores in the knowledge test range from 0 to 100. Cronbach α calculated was 0.71.

Data was analyzed by using the SPSS 22.0 package program. Statistical analyses included descriptive analyzses as number (n), percent (%), arithmetic mean ($\bar{x}$), standard error (SE). Parametric (e.g., One way ANOVA) and non-parametric (e.g., Chi-square) tests were used to predict the differences between the variables according to the distribution of the findings. The significance level was accepted as $p<0.05$ in all statistical analyses.

Results and discussion

According to the results, 56.4% of the participants were female, 43.6% were male, and 18-25, 26-35, 36-45, 56-65-year-old age groups were found 15.5, 36.6, 29.7, and 18.3%, respectively. A study[18] found that 72.5% of male and 80.6% of females were food label readers. Population consists of 2.1% underweight, 35.7% normal, 43.6% pre-obese, 16.2% obese class I, 2.4% were obese class II according to BMI. Pre-obese were higher in BMI groups than others. When the job groups of the participants were examined, 9.3% workers, 27.4% self-employed, 34% civil servants, and 29.3% were housewives. Nutritional counseling time of second group (n=290) 1, 2, 3, and 4 month or more was found 17.1%, 34.1%, 15.6%, 33.2% respectively. When the distribution of counseling (n=290) by gender was examined; it was determined that 57.0% of the women received counseling and 41.8% of the men received counseling.

It was determined that 92.3% of the participants who received nutritional counseling reached the label information through a dietitian. The other group the most preferred among the media tools are radio (92.3%) and newspaper (93.8%). In the study of Ozgul and Aksulu[19], 87% of consumers have shown interest in food label reading in 1995, in 2005 this data increased to 96% and consumers giving importance to food labeling increased from 6.6% to 18.0%. Trandafilović et al.[20] stated that they have a similar relationship with the frequency of food reading and that the level of education affects the frequency of reading. Table 1 shows the food label reading status for purchasing foods due to demographic characteristics and BMI of participants.

According to Table 1, food label reading did not differ for gender ($p<0.05$). But significant differences were obtained in terms of age groups, BMI, education level, profession, and income groups ($p<0.05$). The highest level (48.2%) among participants who always read food label when purchasing foods is in ages 26-35. A similar situation was also found in the pre-obese and normal groups according to BMI. Bachelor education level (67.3%) was found to be the group that always read food label. Housewives (32.2%) constitute the participants who always read food labels among the job groups. In TURKSTAT 2019[21] data of Turkey, it has been determined that individuals with income levels above the poverty line (47.9%) have the highest food label reading.

Demir and Pala[22] stated that 91.7% of the participants read the food labels at the time of purchase. In their study, Budak et al.[23], the food label reading status of the participants was examined according to their educational level, and the label reading rate of the individuals who graduated from college was found to be 89.3%. Akar Sahingoz[24] reported that 58.7% of women and 4.3% of men have a habit of food label reading. In the same study, the rate of food label reading in the 35-44 age group was high, and when the individuals who read labels were examined, it was found that 63.2% had undergraduate education, 83.2% were officers, and 56.5% had income levels between 2501-4000 TL.

In another study[25], food label reading rate of individuals aged 19-34 was 62.7%, income level of 2001 TL and above, individuals with sufficient health literacy and undergraduate and graduate education determined as 64.6%, 64.9%, 65%, respectively.

Table 1. Food label reading according to the purchasing foods for demographic characteristics and BMI

Indicator		Always		Sometimes		Never		p^{**}
		n	%	n	%	n	%	
Gender	Women	141	57.6	166	56.5	20	48.8	0.577
	Men	104	42.4	128	43.5	21	51.2	
	Total	245	100.0	294	100.0	41	100.0	
Age group (years-old)	18-25	28	11.4	58	19.7	4	9.8	*0.000*
	26-35	118	48.2	81	27.6	13	31.7	
	36-45	69	28.2	92	31.3	11	26.8	
	56-65	30	12.2	63	21.4	41	31.7	
	Total	245	100.0	294	100.0	41	100.0	
BMI	Underweight	3	1.2	8	2.7	1	2.4	*0.000*
	Normal	104	42.4	87	29.6	16	39.1	
	Pre-obese	109	44.5	137	46.6	7	17.1	
	Obese Class I	27	11.1	53	18.0	14	34.1	
	Obese Class II	2	0.8	9	3.1	3	7.3	
	Total	245	100.0	294	100.0	41	100.0	
Education Level	Primary and Secondary School	27	11.0	41	14.0	15	36.6	*0.000*
	High School	53	21.6	91	31	10	24.4	
	Bachelor	165	67.3	162	55.1	16	39	
	Total	245	100.0	294	100.0	41	100.0	
Income*	Starvation wage	20	31.3	33	51.6	11	17.2	*0.018*
	Below the poverty	42	34.7	70	57.9	9	7.4	
	Above the poverty	91	47.9	89	46.8	10	5.3	
	Total	42	42.9	50	51	6	6.1	

*Starvation and Poverty Line evaluated according to TURKSTAT January 2019 national data.
** Chi-Square test.

A statistical difference was observed between the receiving nutritional consultancy and the food label reading ($p<0.05$). The food label reading status of the participants was examined according to the duration of their nutritional counseling. The food label reading levels of the participants who received counseling for 1 month, 2 months, 3 months, and 4 months or more were found different ($p<0.05$). When purchasing food, women were most influenced by experiences (38.8%) and the least by advertisements (0.9%). Men, on the other hand, were most affected by experiences (41.9%) and the least by the environment (2.3%).

Coşkun and Kayışoğlu[26] found that the sources of obtaining food label information in women and men are TV (25.4%, 28.7%), newspapers and magazines (19.0, 21.3%), doctors and dieticians (12.9%, 7.5%) and internet (0.9%, 1.7%). Among the reasons for food label reading in the nutrition counseling group, it was seen that the most chosen reason was for a healthy and balanced diet (92.8%), while the least preferred reason was to guide the consumer in fortified food (14.9%). In the other group, the reason for food label reading was found as the healthiest and balanced diet (98.3%) and choosing according to the least is calories (30.0%). From the data obtained, it is understood that most of the participants read food labels for a healthy and balanced diet. It was determined that the percentage of label reading for calorie (66.9%) of individuals who received nutritional counseling was higher than those who did not (30.0%). Another study[23] found that nutrition education and continued diet had a higher frequency of food label reading.

Table 2. Frequency of food label reading and duration of receive nutrition consultancy

Indicator		Always		Sometimes		Never		Total		p^*
		n	%	n	%	n	%	n	%	
Nutrition consultancy	Yes	174	71.0	113	38.4	3	7.3	290	50.0	0.000
	No	71	29.0	181	61.6	38	92.7	290	50.0	
	Total	245	100.0	294	100.0	41	100.0	580	100.0	
Consultancy period (month)	1	12	6.9	37	32.7	1	33.3	50	17.2	0.000
	2	49	28.1	50	44.2	-	-	99	34.1	
	3	33	19.0	12	10.6	-	-	45	15.5	
	4 and more	80	46.0	14	12.4	2	66.7	96	33.1	
	Total	174	100.0	113	100.0	3	100.0	290	100.0	

** Chi-Square test.

In a cross-sectional study conducted in Turkey[27], the level of reading food label information and nutrition knowledge on the food label was found to be 76.5% and 72.4%, respectively. Another aspect of the study is to reveal the attitudes of the participants towards food labels. According to the attitudes and behavior statements of individuals in counseling group, the expressions with the highest and lowest levels of "strongly agree" were determined as “purchasing a product by looking at the expiration date” (86.2%) and “I prefer a more known brand of the same product” (24.8%). In the other group, the highest and lowest levels of "strongly agree" were found to be intelligible (5.2%) in terms of “purchasing products by looking at the expiration date” (69.0%) and “labeling systems made in our country”.

In Table 3, the data represent that a significant difference was found according to the nutrition counseling of participants in dairy products, canned and tomato paste, and meat products ($p<0.05$). other foods were not differed by counseling ($p>0.05$).

Table 3. Food label reading of foods according to nutritional counseling

Foods	Nutrition Consultancy	Food Label Reading								p^*
		Always		Sometimes		Never		Total		
		N	%	n	%	n	%	n	%	
Bakery	Yes	74	25.5	52	17.9	164	56.6	290	100.0	0.187
	No	79	27.2	115	39.7	96	33.1	290	100.0	
Drinks	Yes	206	71.0	53	18.3	31	10.7	290	100.0	0.366
	No	127	43.8	117	40.3	46	15.9	290	100.0	
Dairy Products	Yes	251	86.6	29	10.0	10	3.4	290	100.0	*0.003*
	No	105	70.7	56	19.3	29	10.0	290	100.0	
Canned Food and Tomato Paste	Yes	215	74.1	40	13.8	35	12.1	290	100.0	*0.000*
	No	143	49.3	87	30.0	60	20.7	290	100.0	
Meat and Products	Yes	181	62.4	54	18.6	55	19.0	290	100.0	*0.008*
	No	183	63.1	46	15.9	61	21.0	290	100.0	
Oils	Yes	168	57.9	61	21.0	61	21.1	290	100.0	0.061
	No	127	43.8	89	30.7	74	25.5	290	100.0	
Frozen Processed Foods	Yes	217	74.8	40	13.8	33	11.4	290	100.0	0.218
	No	164	56.6	62	21.4	64	22.1	290	100.0	
Snacks	Yes	173	59.7	54	18.6	63	21.7	290	100.0	0.264
	No	126	43.4	82	28.3	82	28.3	290	100.0	
Honey-Jam-Marmalade	Yes	86	29.7	71	24.5	133	45.9	290	100.0	0.540
	No	98	33.8	104	35.9	88	30.3	290	100.0	

Chopera et al.[18], when looking at the nutritional components that attract the attention of food label readers; 16% contains preservatives, 14% fat, 11.7% vitamin, 11.8% calories, 10.1% carbohydrate

content. In addition, 10.9% of them read sugars, 9.5% protein and 6.7% sodium content of foods. Gezmen-Karadag and Turkozu[28], stated that women and men read the food label while purchasing dairy products 23.9% and 21.8%; in addition, meat products 18.8% and 17.6% respectively. However, saturated fat content food label reading was found 19.9% in women and 17.4% in men, and chocolate and biscuits 21.9% and 18.1%, respectively.

According to the statements of attitude towards food labels, 86.2% of the participants in nutrition counseling groups expressed "*I pay attention to the expiration date when purchasing foods*", 82.1% "*I think that the food labels should be read*", 81.4% "*The amount of fat should be included in the food label*" and 81.7% of strongly agreed with the statements "*The amount of sugar should be included in the food label*". On the other hand, it is seen as an important finding that the level of participants who strongly agree with the statements "*I do not think that reading labels will contribute to me*" and "*Reading food labels is a waste of time*" was 83.8% and 84.5%, respectively. In addition, the level of agreement with the statement "*Labeling systems in our country is insufficient compared to other countries"* was determined as 63.1%. In another study [19], it was emphasized that participants were able to understand the health content of products through food labels.

When the nutrition knowledge scores of all participants on the food labels were examined, the mean score ($\bar{x}\pm SE$) was determined as 75.1±0.755. A difference was found between the scores of the participants in the nutrition knowledge test for food labels in terms of gender, BMI, education level, nutrition consultancy and food label reading ($p<0.05$) which was represented in Table 4. In nutrition knowledge score results showed us in women, normal and pre-obese, bachelor and high school, consultation and always food label reading obtained high scores among their own groups. In Soydemir[29] indicated that women (65.3±16.02) were higher than men, individuals between the ages of 40-49 had the highest knowledge scores, and undergraduates (67.1±16.62) were higher than the others.

Table 4. Nutrition knowledge test scores due to variables

Indicator		$\bar{x}\pm SE$	p^*
Gender	Women	77.6±0.881	*0.000*
	Men	72.0±1.280	
BMI	Underweight	70.2±6.249	*0.000*
	Normal	76.4±1.321	
	Pre-obese	76.2±1.040	
	Obese Class I	70.3±2.024	
	Obese Class II	71.0±4.574	
Education level	Literate	62.7±8.563	*0.000*
	Primary and Secondary School	68.0±2.545	
	High School	75.1±1.434	
	Bachelor	77.0±0.907	
Nutrition consultancy	Yes	83.2±0.700	*0.000*
	No	67.1±1.160	
Food label reading	Always	81.4±0.954	*0.000*
	Sometimes	72.3±1.007	
	Never	58.1±3.962	

*One way ANOVA (Duncan Test) and Independent T test.

Grunert et al.[30] stated that an average of 16.8% of consumers pay attention to nutritional information on the label and the interest in the label increased with age, but the level of nutritional knowledge decreased. Krešić et al.[31], focus on the nutritional knowledge scores by age groups, it was implied that consumers between the ages of 30-44 had the highest score, and with the increase in education level, the average scores of general nutrition knowledge increased and food label reading

rate of individuals with a significantly higher nutrition knowledge was 46%, but low nutrition knowledge was 25%. Hawley et al.[32], there was no significant difference in the education levels of individuals with low nutritional knowledge. However, it was represented that individuals with low nutrition knowledge (33%) had difficulties in understanding label information. Wiles et al.[33] found that nutrition knowledge was higher for those who received higher education and related to their attitudes.

Conclusions

The study results indicate that, women have a higher rate of reading labels than men for food labels, which play an important role in providing the necessary information for consumers to make healthy choices and reach safe and healthy food. However, food label reading of receiving nutrition consultancy has an important place in healthy eating and choosing healthy foods. In addition, it was determined that the nutrition consultancy showed higher participation in the attitude statements prepared for the food labels. Another striking result, participants had a great dilemma in attitudes for food labeling for wasting time and contribution. The fact remains that the knowledge on food labels differs according to nutrition counseling, and participants gain knowledge about food labels in the nutrition consultancy service provided. Considering the whole of the research, it would be beneficial to organize trainings on nutrition labels or to provide nutrition counseling services to all individuals, especially those in the risk group in terms of health, to gain the habit of reading food labels to make healthy food choices and to raise awareness about the positive effect of reading food labels on health.

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Conflict of Interest

All authors declared no conflicts of the study. This manuscript summarized first authors' MSc thesis finished at Selcuk University, Institute of Social Sciences and second author as supervisor.

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