




Yüksek Öğretim Mezunu Yetişkinlerin Beslenme Okuryazarlığı Düzeylerinin İncelenmesi: Akademisyen Grup Örneği

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Investigation of The Nutrition Literacy Levels of Adults with Higher Education Graduate: A Sample of Academician Group

Özet

Amaç: Bu çalışmada, yüksek öğretim mezunu yetişkin bireylerin beslenme okuryazarlığı düzeylerinin saptanması ve sosyo demografik özellikler açısından incelenmesi amaçlanmıştır. **Yöntem:** Kesitsel tipte olan bu araştırma, Türkiye'deki farklı üniversitelerde görev yapan 320 gönüllü akademisyen üzerinde yapılmıştır (erkek:%44.7, kadın:%55.3, ortalama yaş:37.7±10.0 yıl). Araştırmanın verileri, online anket yöntemi ile toplanmıştır. Katılımcıların beslenme okuryazarlığı düzeylerinin belirlenmesi amacı ile "Yetişkinlerde Beslenme Okuryazarlığı Ölçeği" kullanılmıştır. **Bulgular:** Araştırmada, katılımcıların %96.3'ünün beslenme okuryazarlığı düzeyinin yeterli olduğu saptanmıştır. Besinlerin porsiyon miktarlarına ilişkin soruların yer aldığı bölümde ise katılımcıların yarısının (%50.0) yetersiz düzeyde okuryazarlığa sahip olduğu bulunmuştur. Kadınların beslenme okuryazarlığı puanları, erkeklere kıyasla daha yüksektir (p<0.05). Yaş arttıkça beslenme okuryazarlığı puanları azalmaktadır (p>0.05). Bekar olanların, daha iyi gelire sahip olanların, kronik hastalığı olanların ve normal ağırlıkta olanların beslenme okuryazarlığı puanları birbirine yakındır (p>0.05). **Sonuç:** Araştırmanın sonucunda; katılımcıların beslenme okuryazarlığı düzeyleri genel anlamda yüksektir. Ancak; katılımcıların porsiyon miktarları konusunda beslenme okuryazarlık bilgilerinin yetersiz olduğu saptanmıştır. Toplumda sağlık sorunlarını azaltmak ve sağlık düzeyinin geliştirilmesi için beslenme okuryazarlığı kavramının topluma benimsenmesi ve okuryazarlık düzeyinin artırılması için sağlık uzmanları aracılığı ile verilecek beslenme eğitim programlarının yaygınlaştırılmasının yararlı olabileceği düşünülmektedir.

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Anahtar Kelimeler: Beslenme okuryazarlığı, yetişkin, eğitim, sağlık.

Abstract

Objective: In this study, it was aimed to determine the nutritional literacy levels of adults with a higher education graduate and to examine their levels in terms of socio-demographic characteristics. **Method:** This cross-sectional study was conducted on 320 voluntary academicians working at different universities in Turkey (male: 44.7% female: 55.3%; mean age: 37.7±10.0 years). The data of the research were collected by the online survey method. The "Evaluation Instrument of Nutrition Literacy on Adults (EINLA)" was used to determine the nutritional literacy levels of the participants. **Results:** In the study, it was determined that 96.3% of the participants had adequate level of nutrition literacy. In the section where the questions about the portion sizes of foods were included, it was found that half of the participants (50.0%) had had inadequate literacy. Nutritional literacy scores of women were found to be higher than men (p<0.05). Nutritional literacy scores decreased with increasing age (p>0.05). Nutritional literacy scores of those who were single, those with better income, those with chronic diseases and those with normal weight were closer to each other (p>0.05). **Conclusion:** As a result of the research; nutritional literacy levels of the participants were high in general. But; It was determined that the nutrition literacy level of the participants about the portion sizes was inadequate. It is thought that it may be beneficial to disseminate nutrition education programs that will be provided by health professionals in order to adopt the concept of nutritional literacy to the society and to increase the level of literacy in order to reduce health problems and improve the health level.

Key words: Nutrition literacy, adult, education, health.

INTRODUCTION

The role of nutrition as one of the important protective factors in the promotion and maintenance of health throughout life is particularly emphasized (WHO, 2020; Ojo, 2019; BMJ, 2018). It is possible to exhibit healthy living and nutritional behaviors by increasing the awareness of individuals about health and nutrition. This situation requires reaching the right sources of information, understanding these sources correctly, and turning them into behavior. In this sense, the concepts of health and nutrition literacy have gained importance (Perry et al., 2017). Health literacy is defined as the degree to which individuals have the capacity to obtain, process and understand basic health information and services required to make appropriate health decisions (Centers for Disease Control and Prevention, 2020). Nutritional literacy, which is a component of health literacy, is defined as the degree to which individuals have the capacity to acquire, process and understand the nutritional knowledge and skills needed to make appropriate nutritional decisions (Gibbs et al., 2018). There are studies in the literature that revealed the relationship between education level and health and nutritional literacy. In these studies, low education level and low health literacy had been associated with negative health and nutritional behaviors (Michou et al. 2019; González-Chica et al. 2016; Aaby et al 2017). Studies on nutritional literacy revealed that as the level of education increases, nutritional literacy levels also increase (Demir-Özdenk & Özcebe, 2018; Aihara Y, Minai, 2011). Studies that examine the nutritional literacy levels of individuals in different dimensions are needed in order to increase the awareness of the society on healthy eating and to reveal the related factors. In this study, it was aimed to determine the nutritional literacy levels of adults with high education level and to examine in terms of socio-demographic characteristics other than education.

METHOD

This cross-sectional study was conducted between February and May 2020. The universe of the research consisted of academicians working in different universities in Turkey. A sample size was not calculated for the study, and at the time of the study, 320 academicians who agreed to participate were included in the study. Ethical approval was obtained from Selcuk University Faculty of Health Sciences Non-Invasive Clinical Research Ethics Committee to conduct the study (Decision number: 168/2020). Participants were informed in writing prior to the study that their information would be kept confidential, and volunteers were included in

the study. The data of the study was collected by online survey method. The questionnaire included descriptive information, questions to determine general health status, and the "Evaluation Instrument of Nutrition Literacy on Adults (EINLA)" to determine the nutritional literacy levels of the participants. In the study, the body weight (kg), height (cm) values of the participants were recorded according to their own statements, and their body mass index (BMI) was calculated using the body weight (kg)/height (m²) formula. According to the World Health Organization (WHO) classification, the body mass index was classified as <18.5kg/m² "underweight", 18.5-24.9kg/m² "normal weight", 25.0-29.9kg/m² "slightly obese", ≥30.0kg/m² "obese" (WHO, 2019).

Evaluation Instrument of Nutrition Literacy on Adults (EINLA)

Evaluation Instrument of Nutrition Literacy on Adults (EINLA), was developed by Cesar, Koçoğlu and Sümer (2015). The instrument consists of five subsections and 35 questions. In the first part, there are questions about general nutritional knowledge (10 questions), in the second part, understanding and interpreting what you read (6 questions), in the third part, food groups (10 questions), in the fourth part, portion sizes (3 questions), in the fifth part, food label reading and basic mathematics (6 questions). In evaluating the scale, the correct questions are given "1 point", and the questions that are answered incorrectly and left blank are given "0 points". In the section of general nutrition knowledge and food groups; 0-3 points are interpreted as "inadequate", 4-7 points are "limited", 8-10 points are "adequate"; in the reading comprehension and interpretation section and food label reading-basic mathematics the section; 0-2 points are interpreted as "inadequate", 3-4 points are "limited", 5-6 points are "adequate"; in the section of portion sizes, 0-1 points are interpreted as "inadequate", 2 points are "limited" and 3 points are interpreted as "adequate" nutritional literacy level. In the evaluation of the total score of the instrument; 0-11 points are interpreted as "inadequate", 12-23 points "limited", and 24-35 points as "adequate" nutritional literacy. Item difficulty level of the instrument was 0.55, item discrimination power was 0.73, test-retest correlation coefficient was 0.85, Cronbach Alpha reliability coefficient was 0.75. In this study, the Cronbach alpha reliability coefficient was found to be as 0.76.

Statistical Analysis

Statistical Package for the Social Sciences (SPSS)

21.0 program was used to evaluate the data. The Kolmogorov-Smirnov test was performed to determine whether outcome variables were normally distributed, and non-parametric tests were applied. Accordingly, number (n), percentage (%), mean (\bar{X}), standard deviation (SD), median and interquartile

range (IQR) values were presented. Mann Whitney U (Z) and Kruskal Wallis (χ^2) tests were performed to compare the total nutrition literacy scores of participants according to variables. In all analyses, the range of reliability was accepted as 95.0% and evaluated at significance level of $p < 0.05$.

RESULTS

1. Socio-Demographic Characteristics of Participants

Table 1. Socio-Demographic Characteristics of Participants (n:320)

Gender (n, %)		
Men	143	44.7
Women	177	55.3
Age (n, %)		
23-30 years	90	28.2
31-40 years	107	33.5
41-49 years	77	24.1
50-65 years	45	14.1
$\bar{X} \pm SD$ (years)	37.7 \pm 10.0 (23-65)	
Marital Status (n, %)		
Single	126	39.4
Married	194	60.6
Academic Title (n, %)		
Research Asistant	132	41.3
Lecturer	79	24.7
Doctor Lecturer	40	12.5
Associate Professor	42	13.1
Professor	27	8.4
Monthly Income (n, %)		
<5000 TLs	30	9.4
5001-8000 TLs	197	61.6
8001-10000 TLs	54	16.8
≥ 11000 TLs	39	12.2

44.7% of respondents were men and 55.3% were women. Their ages ranged from 23-65 years with an average age of 37.7 \pm 10.0 years. 60.6% were married and 39.4% were single. 41.3% of the participants were research assistant, 24.7% lecturer, 13.1%

associate professor, 12.5% doctor lecturer, 8.4% professor. When their monthly income status was examined, it was found that they had the highest monthly income of 5001-8000 Turkish Liras (TLs), (61.6%).

2. General Health Status of Participants

Table 2. General Health Status of Participants (n:320)

Having Chronic Disease (n, %)		
Yes	93	29.1
No	227	70.9
Taking Medicine Regularly (n, %)		
Yes	85	26.6
No	235	73.4
Anthropometric Characteristic ($\bar{X} \pm SD$, Min.-Max.)		
Height (cm)	166.5 \pm 24.3 (1.60-1.94)	
Weight (kg)	73.7 \pm 15.3 (46.0-120.0)	
BMI (kg/m ²)	25.5 \pm 4.3 (18.5-42.2)	
BMI Groups (n, %)		
Normal Weight	160	50.0
Overweight	119	37.2
Obese	41	12.8

In the study, it was determined that 29.1% of the participants had a chronic disease and 26.6% of them took medicine regularly. The average BMI value was 25.5±4.3 kg/m² and 50.0% of them had

normal weight; 50.0% were overweight or obese. Also it was determined that 15.3% of the participants smoked, 19.1% consumed alcohol.

3. Nutritional Literacy Levels of Participants

Table 3. Nutritional Literacy Levels of Participants (n:320)

	$\bar{X}\pm SD$	Median [IQR]	
Total Score	30.2±3.5	31.0 [3.0]	
General Nutrition Literacy Level	Level	n	%
	Inadequate	3	0.9
	Limited	9	2.8
	Adequate	308	96.3
Sub-Sections of Nutrition Literacy			
1. Section			
(General Nutritional Knowledge)			
	Inadequate	1	0.3
	Limited	37	11.6
	Adequate	282	88.1
2. Section			
(Reading Comprehension and interpretation)			
	Inadequate	4	1.3
	Limited	26	8.1
	Adequate	290	90.6
3. Section			
(Food Groups)			
	Inadequate	6	1.9
	Limited	3	0.9
	Adequate	311	97.2
4. Section			
(Portion Sizes)			
	Inadequate	160	50.0
	Limited	105	32.8
	Adequate	55	17.2
5. Section			
(Food Label and Numerical Literacy)			
	Inadequate	27	8.5
	Limited	77	24.1
	Adequate	216	67.5

The total score that the participants got from the Nutritional Literacy instrument was 30.2±3.5 (median [IQR]: 31.0 [3.0]). In general, 96.3% of the participants found to have adequate nutrition literacy level. When the sub-section levels were examined, it was found that the majority of them were at an adequate level in the general nutrition knowledge section (88.1%), reading comprehension

and interpretation (90.6%), food groups (97.2%), food label reading and numerical literacy (67.5%) sections. In the section of food portion sizes, it was determined that half of the participants (50.0%) had inadequate nutrition literacy, 32.8% of them had limited nutrition literacy; 17.2% had adequate nutrition literacy level.

4. Comparison of Participants' Nutrition Literacy Scale Total Scores According to Socio-Demographic Characteristics

Table 4. Comparison of Participants' Nutrition Literacy Scale Total Scores According to Socio-Demographic Characteristics (n:320)

Variables		$\bar{X}\pm SD$	Median [IQR]	Statistic*
Gender	Men	29.6±4.3	30.0 [3.0]	Z: -2.551 p:0.011
	Women	30.8±2.6	31.0 [4.0]	
Age	23-30 years	30.5±2.5	31.0 [3.0]	χ^2 : 1.334 p:0.721
	31-40 years	30.4±2.9	31.0 [3.0]	
	41-49 years	29.9±4.5	31.0 [3.0]	
	50-65 years	29.7±4.1	30.0 [3.0]	
Marital Status	Single	30.5±2.6	31.0 [3.0]	Z: -0.015 p:0.988
	Married	30.1±3.9	30.1 [3.0]	
Academic Title	Research Asistant	30.5±2.4	31.0 [3.0]	χ^2 : 1.637 p:0.802
	Lecturer	30.3±2.4	31.0 [3.0]	
	Doctor Lecturer	30.2±4.1	31.0 [4.0]	
	Associate Professor	29.9 ±4.6	31.0 [4.0]	
	Professor	29.4 ±4.1	30.0 [3.0]	
Monthly Income	<5000 TLs	30.0±2.8	30.0 [3.0]	χ^2 : 1.365

	5001-8000 TLs	30.2±3.6	31.0 [3.0]	p:0.714
	8001-10000 TLs	30.5±2.6	31.0 [3.0]	
	≥11000 TLs	30.4±4.2	31.0 [3.0]	
Having Chronic Disease	Yes	30.4±2.6	31.0 [3.0]	Z: -0.059
	No	30.1±3.8	31.0 [3.0]	p:0.953
BMI	Normal Weight	30.6±2.6	31.0 [3.0]	Z: -1.392
	Overweight/Obese	29.8±4.1	31.0 [3.0]	p:0.164

*Mann Whitney U Testi (Z), Kruskal Wallis t test (χ^2)

In Table 4, the total nutrition literacy scores of the participants were compared in terms of some variables. Accordingly; the scores of women were found to be higher than the scores of men ($p < 0.05$). According to age, although the difference is not statistically significant, participants aged between 50-65 years old had the lowest score were ($p > 0.05$). According to marital status, the scores of both married and single participants were close to each other ($p > 0.05$). When the scores were examined according to academic titles, it was found that the scores decreased as title grades increased ($p > 0.05$). Regarding the monthly income, it was found that as the amount of income increased, the scores also increased ($p > 0.05$). According to the status of having the chronic disease, the scores of the participants were close to each other ($p > 0.05$). According to BMI status, it was determined that those who were overweight/obese had lower scores ($p > 0.05$).

DISCUSSION

Adequate nutritional literacy is an important factor in healthy nutrition of individuals. In this sense, nutritional literacy has become important concept in health promotion for researchers and health stakeholders (Krause et al., 2016). In this study, it was aimed to determine the nutritional literacy levels of adults with high education level and to examine in terms of socio-demographic characteristics other than education.

In the study, the rate of adequate nutrition literacy level was found to be 96.3%. The majority of the participants were at an adequate level in the general nutrition knowledge section (88.1%). However, the majority of the participants (82.8%) got a low score on the portion sizes of foods (Table 3). In various studies conducted on adults of different educational levels in the world and Turkey, adequate nutritional literacy rates ranged from 30.7% to 94.4% (Demir-Özdenk & Özcebe, 2018; Ünal, 2018; Aihara and Minai, 2011; Zoellner et al., 2009). When the nutritional literacy competency of the participants was examined by sub-sections; similar to the findings of the study, in the study conducted by Bozdoğan (2020) on teachers, the highest adequate nutrition literacy rate was found in the reading

comprehension and interpretation section (96.0%), and the lowest in the portion sizes (21.5%). In another study, conducted by Özdemir (2019) on adults, more than half (57.4%) of whom were university graduates; it was determined that the participants had the highest level of adequacy in general nutritional knowledge (73.5%) and reading and comprehension section (83.2%), and in the portion sizes section, the adequacy ratio was found to be 24.4%, which was close to the ratio (17.2) of those adequate in portion sizes in this study. In Demir-Özdenk and Özcebe (2018)' study conducted on adults, more than half of whom were university graduates (59.2%), it was found that adequacy levels of general nutrition literacy and sub-sections were lower than this study, however; similar to this study, the authors found that the highest scores were obtained from the reading comprehension and interpretation section (71.0%), and the lowest score from the portion sizes (7.3%). The results of previous studies and this study suggest that participants' ability for providing control over portion should be improved.

Many factors, such as socio-demographic, cultural structure and nutritional knowledge level play a role in the individual's healthy diet (Hakli et al. 2016; Wardle, Parmenter and Waller, 2000). When the scores of the participants were analyzed according to age; it was determined that as the age increased, the scores decreased (Table 4, $p > 0.05$). This finding was consistent with the results of other some studies (Ünal 2018; Zoellner et al., 2009). It was also determined that as the titles of the participants increased, the scale scores decreased (Table 4, $p > 0.05$). In general, title degrees in academia increase with age. The decrease in the nutrition literacy scores of the participants with the increase in age and title degree revealed that the findings support each other. The decrease in nutrition literacy score with age can be explained by the preferred information sources and the more active use of information resources by young adults. The results of studies revealed that, while online mass media were a popular source of information, health professionals ranked first in terms of perceived reliability (Quaidoo et al., 2018; Gavgani, Qeisari and Asghari, 2013; Percheski and Hargittai, 2011).

Also, in the study of Heuberger and Ivanitskaya (2011), it was shown that preferred sources of nutrition information differed according to age groups and education level. The authors reported that young adults preferred dieticians, while older adults preferred other healthcare professionals, and young and older adults with lower levels of education preferred mass media and their social environment as information sources. The widespread use of mass media reveals the importance of using such tools. For this reason, the use of educational topics and text messages related to nutrition literacy in broadcast streams can be beneficial.

The findings of studies conducted on the subject in the world and Turkey, vary in terms of the effect of gender on nutrition literacy. For example; in some studies, it was found that there was no significant difference in nutrition literacy between genders (Demir-Özdenk and Özcebe, 2018; Zoellner et al. 2009). On the other hand, in some studies, it was found that the nutritional literacy level of women was better (Bozdoğan, 2020; Michou et al. 2019). Also in this study, the scores of women were found to be higher than those of men (Table 4, $p < 0.05$). The higher nutrition literacy levels of women than men can be explained by the fact that women are also more responsible for household nutrition practices. In a study conducted by Sharma et al. (2008), it was found that women paid more attention to healthy nutrition and were more conscious about the recommended daily food amount. These findings support each other too.

When the nutritional literacy scores of the participants were analyzed according to their marital status; it was determined that the scores were close to each other (Table 4, $p > 0.05$). In his study Açıkkapı (2020) found that the level of nutrition literacy of singles was better, while Demir-Özdenk and Özcebe (2018) found that married people were better.

In the literature, it is stated that the education level is an important parameter affecting the income level of the individual, there is a significant and positive relationship between income level and education level, and furthermore, education has a positive effect on public health (Turcinkova and Stavkova, 2012). In this study, it was found that as the income amount of the participants increased, the scale scores also increased (Table 4, $p > 0.05$). Similar results were obtained in some other studies (Aihara and Minai, 2011; Açıkkapı, 2020).

It was reported that there was a link between low health and nutritional literacy and chronic diseases, and those with poor health and nutrition literacy also

had inadequate disease management skills (Michou et al., 2019). In this study, the scores of the participants were found to be very close to each other according to the status of having a chronic disease (Table 4, $p > 0.05$). Similarly, in a study conducted by Cesur (2014) in Turkey, no significant difference was found between the state of chronic disease and nutrition literacy. However, in Ünal (2018)' study, it was found that those with chronic disease had significantly higher nutrition literacy scores. This result may be due to the fact that individuals with chronic diseases consulted health professionals more often due to their illnesses and were informed about their diets.

It is known that obesity, which is a global public health problem, has a negative relationship with healthy nutrition and behaviors, and nutritional knowledge is an important factor in showing healthy eating behaviors (Wardle, Parmenter & Waller, 2000). However, in studies on behavioral changes, it was emphasized that knowledge alone was not sufficient to change an individual's behaviour; skills, attitudes, behaviors and abilities were also needed. Therefore, the concept of nutrition literacy that is beyond knowledge has gained importance (Vaitkeviciute, Ball and Harris, 2015). When the scale scores of the participants were examined according to their BMI, it was determined that those who were overweight/obese had lower scores than those with normal weight (Table 4, $p > 0.05$). Some studies had also found that as BMI increased, nutrition literacy levels decreased (Ünal, 2018; Aihara and Minai, 2011). One of the main objectives of nutrition education, which is an effective method in developing positive nutritional knowledge and behavior, is to disseminate nutrition literacy (Yardımcı and Özçelik, 2015; Aktaş and Özdoğan 2016). Therefore, it is thought that nutritional literacy levels should be developed in order to create positive behavioral change in individuals.

Studies revealing the effective factors such as nutrition literacy level in healthy eating are important for the development of community health. In this sense, it is believed that the results of this study will contribute to the literature. However, because the implementation process of the study coincided with the pandemic period, the number of participants reached was limited. This was the limitation of the study. In order to generalize the results, it is recommended to conduct similar studies with a larger sample group.

CONCLUSION and SUGGESTIONS

As a result of the study, the level of nutrition literacy

of the participants was found to be high in general. It was thought that this result was due to the fact that all participants had a higher education level. On the other hand, although the participants had adequate knowledge about general nutritional knowledge, food groups and reading comprehension, it was determined that they were inadequate in portion sizes. The study also found that women's nutritional literacy levels were better compared to men's. In addition, although there were no significant differences, nutritional literacy scores decreased with increasing age. It was also found that those who were single, those with better incomes, those with chronic diseases and those of normal weight had higher nutritional literacy scores.

In order to reduce health problems and improve the health level in the society, it is important for individuals to reach the accurate information about nutrition, to increase their knowledge level and ability for converting into behavior. It is believed that it may be beneficial to disseminate nutrition education programs that will be given by health professionals in order to adopt the concept of nutritional literacy to the society and to increase the level of literacy.

It is recommended to investigate the socio-demographic, cultural and economic factors that may be associated with nutrition literacy on a large sample in order to determine the situation on this issue and to increase awareness.

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