

Subject Area  
Healthcare Management

Year: 2022  
Vol: 8 Issue: 102  
PP: 2848-2854

Arrival  
25 August 2022  
Published  
30 September 2022  
Article ID Number  
64273

Article Serial Number  
02




Doi Number  
<http://dx.doi.org/10.29228/sssj.64273>

**How to Cite This Article**  
Sarıyıldız, A. Y., Uysal, B. & Samancı, M. (2022). "The Relationship Between University Students' Health Literacy Levels and Their Attitudes Towards Healthy Nutrition" International Social Sciences Studies Journal, (e-ISSN:2587-1587) Vol:8, Issue:102; pp:2848-2854



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## The Relationship Between University Students' Health Literacy Levels and Their Attitudes Towards Healthy Nutrition<sup>1</sup>

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### ABSTRACT

The aim of the study is to determine the relationship between the health literacy level of university students and their attitudes towards healthy eating. The universe of the study consists of 21035 students studying at Bilecik Şeyh Edebali University and Samsun University. The sample of the study was determined as 377 students in the calculation of the sample, which was carried out with a 95% confidence interval, 5% margin of error, and 50% incidence and 50% absence. Simple random sampling method was used as the sampling method in the study, and the study was carried out on 377 students between 24.02.2022 and 25.05.2022. In the study, the European Health Literacy Scale, the Turkish version of which was validated by Aras and Bayık Temel (2017), and the Attitude towards Healthy Eating Scale developed by Tekkurşun Demir and Cicioğlu (2019) were used. As a result of the correlation analysis, it was determined that there was a significant, positive and low level relationship between university students' attitudes towards healthy eating and their health literacy levels ( $r=0.384$ ). With an attitude towards healthy eating; A positive, significant and low correlation ( $r=0.293$ ) between Access to Information, one of the sub-dimensions of Health Literacy; A positive, significant and low relationship between Understanding Information ( $r= 0.334$ ); There is a positive, significant and low relationship between Appraisal/Evaluation ( $r=.0343$ ) and a positive, significant and low-level relationship ( $r= 0.338$ ) between Application / Use dimension. As a result, as the health literacy level of university students increases, the attitudes towards healthy eating increase at a low level.

**Keywords:** Health Literacy; Healthy Nutrition; Health Management

## 1. INTRODUCTION

In today's societies, getting a place in the health system and making significant progress can be difficult even for people with a high level of education. Kickbusch, Pelikan, Apfel, and Tsouros (2013) stated that information societies in the 21st century experience a paradox of health decision-making. This paradox results in a health literacy crisis for Europe and beyond. In the book "Health Literacy" published by Kickbusch et al. (2013), the European Health Literacy Survey applied to eight European countries is mentioned. According to the study, almost half of all adults in the eight European countries studied had inadequate or problematic health literacy skills that negatively affected health literacy (Kickbusch, Pelikan, Apfel, & Tsouros, 2013). The concepts of health and literacy are highly interrelated concepts in the literature. An individual who lacks literacy will have great difficulty in managing his/her own health, and the individual's ability to express himself/herself in the field of health will be very limited (Soysal & Obuz, 2020). Although the concept of health literacy, which has been used in the literature for at least 30 years, was first used in the field of health education in 1974, it was not widely used even in the 1990s. While health literacy was defined as individuals' ability to read, understand and fulfill health-related information until the 1990s, more comprehensive definitions of the concept of health literacy have emerged after the 1990s (Yılmaz Güven, Bulut, & Öztürk; 2018). In its most current form, health literacy is defined as the degree to which individuals have the ability to find, understand and use information and services to make health-related decisions and actions for themselves and others (Eslami, Tavakoly Sany, Ghavami, & Peyman, 2022). In a systematic review study by Liu et al. (2020), it was concluded that health literacy encompasses three elements: knowledge of health and health systems, the ability to process and use information about health and health services in various formats, and finally the ability to protect health through self-management and collaboration with health providers.

<sup>1</sup> This study was presented as a summary paper at the Karadeniz 9th International Conference on Applied Sciences held between 25-26 June 2022.

Some studies indicate that health literacy is a much stronger determinant of health than factors such as education level, gender, income, etc. As a matter of fact, the World Health Organization (WHO) defined health literacy as one of the biggest determinants of health (Eslami, Tavakoly Sany, Ghavami, & Peyman, 2022). Health literacy is in fact seen as a social determinant of health for both individuals and societies due to its impact on socioeconomic status, employment and ability to access services (Adams, 2010). Patients and their families need adequate health literacy, which includes a number of basic processes such as accessing, obtaining, understanding, evaluating and applying health-related information in order to understand health information and actively participate during periods of illness (Papadacos et al. 2021). Therefore, health literacy skills are essential for individuals to have knowledge about health problems, make the right health decisions and benefit from health services (Eslami, Tavakoly Sany, Ghavami, & Peyman, 2022). There are many assumptions in the literature that inadequate health literacy means poor understanding of health communication, which leads to inadequate self-management, poor perceptions of health responsibility and inappropriate health service utilization (Adams, 2010). Inadequate health literacy may be associated with the non-use of preventive health services, delayed disease diagnoses and increased healthcare costs. The annual cost of inadequate health literacy in Canada is estimated to be 3-5% of the total health budget (Papadacos et al. 2021). High health literacy has a great impact and importance on healthy behaviors and adoption of preventive healthcare (Eslami, Tavakoly Sany, Ghavami, & Peyman, 2022). In addition to all these, self-management practice skills may differ according to the patient's level of health literacy (Adams, 2010).

Health literacy is recognized as an important predictor of many chronic diseases such as diabetes (Adams, 2010). At the same time, available scientific data show that improper and irregular nutrition is also a major factor in the emergence of health problems (Yıldırım, Kızıltan, & Akçil Ok, 2021). In this context, nutrition literacy is also of great importance. The concept of nutrition literacy is defined as the capacity of individuals to access, comprehend, interpret and apply basic information and services related to nutrition (Carbone & Zoellner, 2012).

In this study, it was aimed to determine the levels of health literacy and attitudes towards nutrition of undergraduate students and to determine whether there is any relationship between these variables.

## 2. METHOD

### 2.1. Population and Sample of the Study

Since it was not possible to reach the entire population due to reasons such as the large number of people in the population, cost and time limitations, it was preferred to select a sample from the population. When the literature was examined, it was seen that a sample of 384 people represented the population of 1,000,000-100,000,000 people with a 95% confidence interval and a 5% margin of error (Yazıcıoğlu & Erdoğan, 2004).

Participation in the research is voluntary. The population of the study consists of all students at Samsun University and Bilecik Şeyh Edebali University. All students were included in the study and it was planned to conduct a study on 377 students with a 5% margin of error at 95% confidence interval based on simple random sampling from a total of 21035 students.

### 2.2. Limitations of the Study

There are no exclusion criteria. All students in the sample were included in the study. Since the survey was prepared and distributed online, people who do not use the internet and cannot access the web link of the survey are among the limitations of the study. In addition, the research is limited to the dates 24.02.2022 - 25.05.2022.

#### 1.1. Data Collection Methods and Tools

This study is a cross-sectional study based on a questionnaire. The study was designed to cover two universities in Turkey (Samsun University and Bilecik Şeyh Edebali University). The questionnaire was administered through an online survey system (Google Forms) created by the researchers. Along with nine socio-demographic questions, the questionnaire includes the European Health Literacy Scale consisting of 25 statements and the Attitude Scale for Healthy Nutrition consisting of 21 statements. The scales are standardized and validity and reliability studies were conducted by the scale owners. The validity and reliability study of the Turkish form of the European Health Literacy Scale was conducted by Aras and Bayık Temel (2017). Attitude Scale for Healthy Nutrition was developed by Tekkurşun Demir and Cicioğlu (2019). The questionnaires were administered after obtaining permission from the relevant Universities. The total number of participants in the survey was 377.

### 2.3. Analysis of Data

The data obtained from the questionnaires will be analyzed with SPSS (Statistical Package for the Social Sciences) program and Lisrel program. In order to analyze whether there were significant differences according to the

personal characteristics of the participants, comparison analyses according to the normality of the distribution (parametric tests for normal distribution; non-parametric tests for non-normal distribution), correlation and simple-multiple regression analyses were performed between the dimensions of the scales.

### 3. RESULTS

In this chapter; The findings regarding the personal characteristics of the participants and the results of the basic and advanced analysis regarding the dimensions/variables of the research were examined. Since the application of the questionnaire was carried out with the online survey system, the participants were required to participate in all statements in the scales, and since the questionnaires were completed on a voluntary basis, there is no missing data.

**Table 1.** Participants' Socio-Demographic Characteristics

<i>Your University</i>	<i>n</i>	<i>%</i>	<i>Frequency of health services use</i>	<i>n</i>	<i>%</i>
Bilecik Şeyh Edebali University	181	48	Very little	168	44,6
Samsun University	196	52	Medium	187	49,6
<i>Gender</i>	<i>n</i>	<i>%</i>	Too much	21	5,6
Male	85	22,55	<i>Do you use medicine without consulting a doctor?</i>	<i>n</i>	<i>%</i>
Female	292	77,45	Yes	162	43
<i>Class Level</i>	<i>n</i>	<i>%</i>	No	215	57
First year	132	35	<i>Do you think you are well informed about health?</i>	<i>n</i>	<i>%</i>
Second year	112	29,7	Yes	245	65
Third year	127	33,7	No	132	35
Fourth year	6	1,6	<i>Interested in doing research in the health field?</i>	<i>n</i>	<i>%</i>
<i>The way of life during the school terms</i>	<i>n</i>	<i>%</i>	Yes	300	79,6
I'm living with my family	102	27,1	No	77	20,4
I live in a student house or dormitory	275	72,9	<b>Total</b>	<b>377</b>	<b>100</b>

**Table 2.** Reliability, Normality Test and Descriptive Statistics for the Scales and Subscales

Dimensions	Cronbach $\alpha$	Normality $p$	Min	Max	$\bar{x} \pm ss$	1	1.1.	1.2	1.3	1.4	2	2.1	2.2	2.3	2.4
<b>1. Attitude Scale for Healthy Nutrition</b>	.809	,025	45	101	71,52 $\pm$ 11,5	-									
1.1. Information About Nutrition	.831	,000	9	25	20,14 $\pm$ 3,6	,51	-								
1.2. Feeling Towards Nutrition	.742	,001	6	29	16,49 $\pm$ 5	,64	0,04	-							
1.3. Positive Eating Habit	.758	,000	5	25	16,34 $\pm$ 4,7	,67	,381	,127	-						
1.4. Bad Eating Habit	.745	,000	5	25	18,55 $\pm$ 4,4	,73	,150	,416	,333	-					
<b>2. Health Literacy Scale</b>	.936	,000	49	125	102,27 $\pm$ 15,4	,38	,526	0,07	,394	,139	-				
2.1. Access to Information	.860	,000	5	25	20,74 $\pm$ 3,6	,29	,471	-	,310	,121	,803	-			
2.2. Understanding Information	.814	,000	14	35	28,90 $\pm$ 4,7	,33	,492	0,07	,349	0,08	,882	,656	-		
2.3. Assessment/Evaluation	.850	,000	17	40	32,51 $\pm$ 5,51	,34	,458	0,09	,349	,101	,928	,650	,766	-	
2.4. Application/Utilization	.788	,000	5	25	20,11 $\pm$ 3,82	,33	,430	0,04	,343	,161	,817	,568	,590	,709	-

\*Shapiro-Wilk  $\bar{x}$ = average sd = standard deviation p= statistical significance value

\*\*Correlation is significant at the level 0,01 (double-quoted)

Table 2 shows the reliability, normality test and descriptive statistics of the subscales. Cronbach's alpha ( $\alpha$ ) coefficient of ASHN was found to be 0.809. Among the subdimensions, the coefficient of Information About Nutrition is 0.831, which is higher than the other dimensions. The Cronbach's alpha ( $\alpha$ ) coefficient of the Health Literacy Scale was found to be 0.936. The coefficient of Access to Information, one of the subdimensions, is 0.860, which is higher than the other dimensions.

The results of the Shapiro-Wilk test were analyzed to determine which tests would be used in the analyses. Since the distribution was not normally distributed, nonparametric test methods were used in the analyses ( $p < .05$ ).

In the descriptive statistical analysis for the scales and subdimensions, the average of ASHN was 71.52. Among the subdimensions of ASHN: Information on Nutrition 20.14 $\pm$ 3.6; Feeling Towards Nutrition 16.49 $\pm$ 5; Positive Eating Habits were 16.34 $\pm$ 4.7 and Bad Eating Habits were 18.55 $\pm$ 4.4. The average of the Health Literacy Scale is 102.27. Access to Information, one of the subdimensions of the Health Literacy Scale, was 20.74 $\pm$ 3.6; Understanding Information 28.90 $\pm$ 4.7; Appraisal/Evaluation was found to be 32.51 $\pm$ 5.51 and Application/Using 20.11 $\pm$ 3.82.

According to the results of the correlation analysis, there is a positive, significant and low level relationship between ASHN and Health Literacy ( $r=0.384$ ). There is a positive, significant and low-level relationship with

Access to Information ( $r=0.293$ ); a positive, significant and low-level relationship with Understanding Information ( $r=0.334$ ); a positive, significant and low-level relationship with Appraisal/Evaluation ( $r=.0343$ ); and a positive, significant and low-level relationship with Application/Use dimension ( $r=0.338$ ). Based on these findings, it can be said that as health literacy increases, attitudes towards healthy eating increase slightly.

**Table 3.** Socio-Demographic Comparison Analyses of Subdimensions

Variables	1. Attitude Towards Healthy Nutrition	1.1. Information About Nutrition	1.2. Feeling Towards Nutrition	1.3. Positive Eating Habit	1.4. Bad Eating Habit	2. Health Literacy	2.1. Access to Information	2.2. Understanding Information	2.3. Assessment/Evaluation	2.4. Application/Utilization
<b>Your University</b>										
<i>p for difference</i>	0,54	0,534	0,019*	0,966	0,834	0,251	0,399	0,587	0,216	0,193
Bilecik Şeyh Edebali University	185	193	175	189	188	196	194	192	196	197
Samsun University	192	186	202	189	190	183	184	186	182	182
<b>Gender</b>										
<i>p for difference</i>	,570	,188	,213	,768	,270	,009**	,307	,001*	,014*	,102
Male	195	175	202	192	200	162	178	155	163	172
Female	187	193	185	188	186	197	192	199	196	194
<b>Class Level</b>										
<i>p for difference</i>	,253	,054	,446	,547	,508	,266	,839	,051	,380	,306
First year	182	177	189	185	185	198	195	200	197	193
Second year	206	208	201	197	202	193	184	200	190	194
Third year	181	181	180	184	183	174	187	167	178	177
Fourth year	199	250	163	234	168	223	208	193	233	248
<b>The way of life during the school terms</b>										
<i>p for difference</i>	,000**	,031*	,316	,000**	,004**	,016*	,040*	,013*	,029*	,146
I'm living with my family	224	209	198	228	216	211	208	212	209	202
I live in a student house or dormitory	176	182	186	174	179	181	182	181	182	184
<b>Frequency of health services use</b>										
<i>p for difference</i>	,347	,620	,677	,260	,389	,151	,187	,191	,249	,323
Very little	181	185	184	179	188	179	183	180	181	180
Medium	197	190	193	198	192	193	189	192	191	195
Too much	175	209	181	179	158	225	229	223	221	205
<b>Do you use medicine without consulting a doctor?</b>										
<i>p for difference</i>	,000**	,081	,000**	,001**	,067	,022*	,980	,014*	,007**	,026*
1. Yes	161	178	162	167	177	174	189	173	172	175
2. No	210	197	210	205	198	200	189	201	202	200
<b>Do you think you are well informed about health?</b>										
<i>p for difference</i>	,000**	,000**	,960	,000**	,005**	,000**	,000*	,000**	,000**	,000**
1. Yes	206	208	189	207	201	219	214	219	216	210
2. No	158	154	189	156	168	133	143	134	138	151
<b>Interested in doing research in the health field?</b>										
<i>p for difference</i>	,016*	,071	,167	,060	,187	,031*	,025*	,021*	,045*	,214
1. Yes	196	194	193	194	193	195	195	196	195	193
2. No	162	169	174	168	174	165	164	163	167	175

\* $p<0.05$ = significance value

\*\*  $p<0.01$ = significance value

The results of the comparison analysis according to the subdimensions in terms of variables are given in Table 3.

In terms of the university variable, a statistically significant relationship was found only in the Feeling Towards Nutrition dimension ( $p=0.019$ ). Samsun University's scores (rank average= 202) are higher than Bilecik Şeyh Edebali University's (rank average= 175).

While there was no significant relationship in Attitude Towards Healthy Nutrition and its subdimensions in terms of gender variable ( $p > 0.05$ ), the score of female students (rank average=197) was higher than male students (rank average= 162) in the general dimension of Health Literacy ( $p = .009$ ), and in the subdimension of Understanding Information ( $p = .001$ ) the scores of female students (rank average= 199) were higher than those of male students (rank mean= 155) and in the Valuing/Evaluation dimension ( $p = .014$ ) the scores of female students (rank average= 196) were higher than those of male students (rank average= 163) and a statistically significant relationship was found.

No statistically significant relationship was found in the general and subdimensions of ASHN and Health Literacy scale in terms of class level variable ( $p > 0.05$ ).

A statistically significant relationship was found between the general dimension of the ASHN ( $p = .000$ ) and the subdimensions of Information About Nutrition ( $p = .031$ ), Positive Eating Habits ( $p = .000$ ) and Poor Eating Habits ( $p = .004$ ) in terms of the way of living in school terms. The scores of those who say they live with my family in both general and subdimensions are higher than those who say they live in a student house or dormitory.

No statistically significant relationship was found in the general and subdimensions of ASHN and Health Literacy scale in terms of the frequency of healthcare use ( $p > 0.05$ ).

A statistically significant relationship was found between the overall dimension of the ASHN ( $p = .000$ ) and the subdimensions of Feeling Towards Nutrition ( $p = .000$ ), Positive Eating Habits ( $p = .001$ ) and Poor Eating Habits ( $p = .001$ ) in terms of the variable "Do you use medication without consulting a doctor?". A statistically significant relationship was found between the overall dimension of the Health Literacy Scale ( $p = 0.22$ ) and the subdimensions of Understanding Information ( $p = .014$ ), Appraisal/Evaluation ( $p = .007$ ), and Practice/Using ( $p = .026$ ). The average of those who say that they do not use drugs without consulting a doctor in both general and subdimensions is higher.

In terms of the variable "Do you think you are knowledgeable about health?" statistically significant relationships were found in the general dimension of ASHN ( $p = .000$ ) and the subdimensions of Information About Nutrition ( $p = .000$ ), Positive Eating Habits ( $p = .000$ ) and Poor Eating Habits ( $p = .005$ ). Those who think that they are knowledgeable about health in both the general and subdimensions have a higher score. Access to Information ( $p = .000$ ), Understanding Information ( $p = .000$ ), Appraisal/Evaluation ( $p = .000$ ), and Practice/Using ( $p = .000$ ) with the Health Literacy Scale overall dimension ( $p = .000$ ) Statistically significant relationships were found in the subdimensions. Those who think that they are knowledgeable about health in both general dimensions and subdimensions have higher scores.

Statistically significant relationships were found in the general dimension of ASHN ( $p = .016$ ) in terms of the variable "Are you interested in doing research in the field of health?". Those who are interested in doing research in the field of health have a higher score. Statistically significant relationships were found between the Health Literacy Scale general dimension ( $p = .031$ ) and Access to Information ( $p = .025$ ), Understanding Information ( $p = .021$ ), and Evaluation/Evaluation ( $p = .045$ ) subdimensions. Those who are interested in doing research in the field of health in both general dimensions and subdimensions have higher scores.

#### 4. DISCUSSION AND CONCLUSION

In the literature, there is no study examining health literacy and ASHN in students. This situation constitutes the original aspect of the study.

In the study, a positive, significant and low-level relationship was found between ASHN and Health Literacy. A positive, significant and low relationship with Access to Information, one of the subdimensions of Health Literacy, a positive, significant and low relationship with Understanding Information, a positive, significant and low relationship with Appraisal/Evaluation, and a positive relationship with Practice / Use There is a significant and low level relationship.

In a study conducted by Özenoğlu et al. (2021), a significant positive correlation was found between the age variable and the general dimension of ASHN. There are other studies in the literature in which there is a significant positive correlation between the age variable and the general dimension of ASHN (Coveney, Cox, & Hendrie, 2008; Henauv et al., 2009).

In the study conducted by Özenoğlu et al. (2021), it was concluded that the participants' ASHN general dimension scores did not show a significant difference according to gender, education level and social media use. According to the results of the same study, among the subdimensions of ASHN, women had higher mean scores than men in the "Information About Nutrition Subdimension", while men had higher mean scores than women in the "Feeling

Towards Nutrition Subdimension". According to the study conducted by Tekkurşun Demir, Namlı, and Cicioğlu (2021), it was concluded that there was no significant relationship between gender and ASHN.

In the study conducted by Ulaş and Genç (2010), it was concluded that the Attitudes Towards Healthy Nutrition of individuals differ significantly according to age, gender, marital status and socioeconomic level. In our study, it was concluded that there was no significant difference between the genders of the individuals and their Attitudes to Healthy Nutrition. It is thought that the reason for this difference is the sample difference in which the study was conducted and the differences in the socio-demographic characteristics and cultural characteristics of the places where the studies were carried out.

In the literature, there are studies that conclude that there is a significant relationship between health literacy and factors such as age and gender, or not. In the study conducted by İnkaya and Tüzer (2018), a significant relationship was found between the health literacy levels of university students and the variables of gender and age. According to the results of the study, while the health literacy level of the students increased as the age increased, the health literacy level of the female students was higher than that of the males. Sukys et al. (2017), it was concluded that the health literacy level of female students is higher than that of male students. Vozikis et al. (2014) study results indicate that there is a significant difference between students' health literacy levels and gender, family income variables. Van Duogh et al. (2007), on the contrary to other studies, it was concluded that the health literacy level of men is higher than that of women. It is thought that the reason for these differences in the literature is the sample size and the differences in the socio-cultural structures of the areas where the studies were carried out.

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