Samsun Sağlık Bilimleri Dergisi,
Journal of Samsun Health Sciences
e-ISSN: 2791-9722, JSHS December 2022, 7(3): 757-778

Health and Environmental Literacy Levels of Immigrant and Non-Immigrant University Students and Related Factors

Göçmen Olan ve Olmayan Üniversite Öğrencilerinin Sağlık ve Çevre Okuryazarlık Düzeyleri ve İlişkili Faktörler

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Makale Bilgisi / Article Information

Makale Türü / Article Types: Araştırma Makalesi / Research Article
Geliş Tarihi / Received: 03 Haziran / June 2022
Kabul Tarihi / Accepted: 28 Temmuz / July 2022
Yıl / Year: 2022 | **Cilt – Volume:** 7 | **Sayı – Issue:** 3 |**Sayfa / Pages:** 757-778

Atıf/Cite as: Gökçay, G. ve Çevirme, A. "Health and Environmental Literacy Levels Of Immigrant and Non-Immigrant University Students and Related Factors " Journal of Samsun Health Sciences 7(3), December 2022: 757-778.

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Yazar Notu / Author Note: "Bu çalışma; V. Hemşireliği Güçlendirme Sempozyumu'na bildiri olarak kabul edilmiştir."

https://doi.org/10.47115/jshs.1125651

HEALTH AND ENVIRONMENTAL LITERACY LEVELS OF IMMIGRANT AND NON-IMMIGRANT UNIVERSITY STUDENTS AND RELATED FACTORS

ABSTRACT:

Aim: The aim of this study is to determine the health and environmental literacy levels and related factors of immigrant and non-immigrant university students.

Method: The research was carried out in descriptive and relationship-seeking type. The study sample constitute 860 students studying at a state university in the East of Turkey. The data were collected with the Socio-demographic Information Form, Turkey Health Literacy Scale (THLS-32) and Environmental Literacy Scale. Evaluation of the data; It was performed by using SPSS package program with number, percentage, mean, standard deviation, t test, f test and correlation analysis. Statistical significance was accepted as $p<0.05$.

Results: In the research, 45.5% of the participants are immigrants and 54.5% are non-immigrant students. It was determined that Immigrant Students got 31.33±5.59 points from THLS-32 and 71.00±15.39 points from Environmental literacy. It was determined that Non-Immigrant Students scored 18.62±9.68 in THLS-32 and 78.53±9.30 in Environmental literacy. Health literacy and sub-dimension scores of men, migrants, employees, those with high education level and class, those who consume water daily and students who do not consume harmful substances are higher; It was found that students who are not immigrants, first 1.class, consume 0-1 liters of water and don't consume harmful substances have higher environmental literacy. A weak negative relationship was found between health and environmental literacy.

Conclusion and Suggestions: A weak negative correlation was found between health and environmental literacy. It was found that the vast majority of students had inadequate or problematic/limited health literacy (77.5%) and high environmental literacy (60.8%). There was a weak negative relationship between health and environmental literacy. In higher education institutions, it is recommended to rise awareness with health and HL integrated educations in the curriculum from the first grade.

Keywords: *Immigrants; University; Students; Health Literacy; Environmental Health.*

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GÖÇMEN OLAN VE OLMAYAN ÜNİVERSİTE ÖĞRENCİLERİNİN SAĞLIK VE ÇEVRE OKURYAZARLIK DÜZEYLERİ VE İLİŞKİLİ FAKTÖRLER

ÖZ:

Amaç: Bu çalışmanın amacı, göçmen ve göçmen olmayan üniversite öğrencilerinin sağlık ve çevre okuryazarlık düzeylerini ve ilişkili faktörleri belirlemektir.

Yöntem: Araştırma tanımlayıcı ve ilişki arayıcı türde yürütülmüştür. Araştırmanın örneklemini Türkiye'nin doğusunda bir devlet üniversitesinde öğrenim gören 860 öğrenci oluşturmuştur. Veriler Sosyodemografik Bilgi Formu, Türkiye Sağlık Okuryazarlığı Ölçeği (TSOY-32) ve Çevre Okuryazarlığı Ölçeği ile toplanmıştır. Verilerin değerlendirilmesi; sayı, yüzde, ortalama, standart sapma, t testi, f testi ve korelasyon analizi ile SPSS paket programı kullanılarak yapılmıştır. İstatistiksel anlamlılık $p<0.05$ olarak kabul edilmiştir.

Bulgular: Araştırmada, katılımcıların %45.5'i göçmen ve %54.5'i göçmen olmayan öğrencilerdir. Göçmen Öğrenciler TSOY-32'den 31.33±5.59 puan ve Çevre okuryazarlığından 71.00±15.39 puan aldığı saptanmıştır. Göçmen Olmayan Öğrenciler THLS-32'den 18.62±9.68 puan ve Çevre okuryazarlığından 78.53±9.30 aldığı saptanmıştır. Erkekler, göçmenler, çalışanlar, eğitim düzeyi ve sınıfı yüksek olanlar, günlük su tüketenler ve zararlı madde tüketmeyen öğrencilerin sağlık okuryazarlığı ve alt boyut puanları daha yüksek; göçmen olmayan, birinci sınıf, 0-1 litre su tüketen ve zararlı madde tüketmeyen öğrencilerin çevre okuryazarlığının daha yüksek olduğu bulunmuştur. Sağlık ve çevre okuryazarlığı arasında zayıf bir negatif ilişki bulunmuştur.

Sonuç ve Öneriler: Öğrencilerin büyük çoğunluğunun yetersiz veya sorunlu/sınırlı sağlık okuryazarlığına (%77.5) ve yüksek çevre okuryazarlığına (%60.8) sahip olduğu tespit edilmiştir. Sağlık ile çevre okuryazarlığı arasında zayıf bir negatif ilişki bulunmuştur. Yükseköğretim kurumlarında birinci sınıftan itibaren müfredatta yer alan sağlık ve sağlık okuryazarlığı entegre eğitimleri ile farkındalığın artırılması önerilmektedir.

Anahtar Kelimeler: *Göçmenler; Üniversite; Öğrenciler; Sağlık Okuryazarlığı; Çevresel Sağlık.*

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INTRODUCTION

Health literacy expresses the cognitive and social skills that determine the individuals' motivations and abilities to access, understand, and use the information to improve and preserve their health (Babatunde-Sowole et al., 2020; WHO, 2020).

Indiviuals should have sufficient healt literacy to lead a healtier life (Ilgaz and Gözüm, 2016). Insufficient (low) health literacy may lead to an increase in hospital visits, less use of preventive health services, delays in the search for healthcare during the symptomatic period, poor compliance with the care, poor health status, insufficiency in dependence on medical instructions, and increase in healthcare costs and mortality (Baker et al., 2007; Berkman et al., 2010; Hoffman et al., 2020). Supporting individuals and societies to increase control over their health through health literacy and health education is important for preventive health services (Babatunde-Sowole et al., 2020). Also, maintaining a healthy life and forming a healthy society are possible with the protection of the environment we live in (Öztürk, 2016). Environmental factors are also important determinants of individual and public health (Alipbekova & Buleshov, 2021; Bircher & Kuruvilla, 2014; Štelemėkas et al., 2021). Community awareness and education on environmental protection has an important role in promoting environmental behavior (Choe et al., 2020; Nourmoradi et al., 2021). Environmental literacy is the degree to which individuals have the capacity to understand, process and use environmental information needed to make sustainable and environmentally conscious decisions (Bloyd Null et al., 2021). Human health and welfare, which are closely related to environmental status, are important for clean air and water, productive soil and habitat for food production, basic needs as well as for climate scheme and preventing floods. While access to green and blue areas supports welfare, individuals' exposure to polluted air, noise and hazardous chemicals distorts their health. The World Health Organization reported that environmental stressors cause 12-18% of all deaths in 53 countries. The air, water and noise hygiene may increase the quality of the environment for preventing diseases and improving human health (EEA report, 2018).

Environmental problems such as deforestation, ozone depletion, global warming, air pollution and depletion of natural resources have now reached the point affecting all living things on earth (Derman and Hacıeminoğlu, 2017). Atabek-Yiğit et al. have stated that environmental problems affect more and more people with each passing day and their prevention would be possible with the high-level environmental literacy of all individuals in the society (Atabek-Yiğit et al., 2014). Environmentally literate individuals are sensitive to environmental issues, knowledgeable about the environment, and have a positive attitude towards environmental issues (Akıllı & Genç, 2015; Duman & Yurtseven, 2022). An increasing number of evidence suggests that environmental risks are not evenly distributed in

society but rather disproportionately, and negatively affect socially disadvantaged and vulnerable population groups. The socioeconomic status of the individual affects their exposure to environmental stressors because poorer, more vulnerable and aggrieved people are more likely to live in a degraded environment. Socially disadvantaged individuals might be more sensitive toward the effects of environmental stressors due to their certain behaviors like smoking and immobility with their current health conditions and weak nutrition conditions. Additionally, they may encounter some limitations regarding compliance with and avoidance from environmental risks (EEA report, 2018). One of these disadvantaged groups is immigrants (Gemici, 2014). Although individuals, who immigrate from other countries for educational purposes or to live a more comfortable life, decide to immigrate without any external coercion and with their free will, they may be deprived of some opportunities that they had in the country they were born, in their new lives. Habitation, social insurance and even cultural difference may turn into a disadvantage. Living in a healthy, safe and livable environment might be even more difficult for immigrant university students. This difficulty may affect the access, understanding and usage motivations of immigrants in a way to improve and protect their health (EEA report, 2018). At the same time, The universities may aim to support the students' health and welfare by detecting the gaps in their health literacy and to increase the number of preventative health measures that can be taken, and this might be useful for their studies and might help them to provide better health in the longer term (Storey et al., 2020). It is reported that preventable environmental risks, which cause at least 12.6 million deaths each year and constitute about a quarter of the global burden of the disease, have an important role in the protection and promotion of health (WHO, 2016; WHO, 2019; Yildirim & Koçak, 2021).

There is no study that determines the health and environmental literacy levels of immigrant and nonimmigrant students and related factors in the literature. This study aimed to determine the health and environmental literacy levels of immigrant and nonimmigrant university students and related factors, and to contribute to the relevant literature. The study also aimed to determine the effect of culture on the students' health and environmental literacy. In this regard, the following study questions were indicated:

- What are the health literacy levels of immigrant and nonimmigrant students?
- Is the relationship between sociodemographic characteristics of immigrant and non-immigrant students and health literacy significant?
- What are the environmental literacy levels of immigrant and nonimmigrant students?

- Is the relationship between sociodemographic characteristics of immigrant and non-immigrant students and environmental literacy significant?

- Are there any correlations between the health literacy and environmental literacy scores of immigrant and nonimmigrant students?

METHODS

Design and Sample

A descriptive and correlational research design was used in this study. The population of the study included 20245 students including 1783 immigrant university students who studied in different departments at Kafkas University in the 2019-2020 spring semester. The sample size was calculated as 316 immigrant students and 376 nonimmigrant students with a ±5% sampling error at a 99% confidence interval for the nonhomogeneous population (Sample calculation system 2021). The study was completed with 860 students including 391 immigrant students.

Data Collection Tools

The Sociodemographic Information Form: The questionnaire was constituted by the researchers in line with the literature (19 Turkish students,19+2 Immigrant students) (Atabek-Yiğit et al., 2014; Demirtaş et al., 2018; Evans et al., 2019; Güven et al., 2018; Koç et al., 2018; Şahinöz et al., 2018; Okyay et al., 2016). Questions such as the gender, age, educational status of the students, and the number of visits to the health institution in the last year were included.

The Turkish Health Literacy Scale (THLS-32): The THLS-32 was developed by Okyay et al. (2016) and it has two subdimensions (treatment, prevention from diseases, and health promotion) and 32 statements including a health-related decision-making process and four processes of obtaining information about practices (access, understanding, evaluation and use/nonuse). Each item is optionized as very easy, easy, difficult, very difficult and no idea. The value that can be obtained from the scale based on the answers given changes between 0-50. The scores obtained from the scale were ranked as follows in the evaluation of the scale; 0-25 points as insufficient health literacy, >25-33 points as problematic/limited health literacy, >33-42 points sufficient health literacy, and >42-50 points as excellent health literacy. In the study in which the scale was developed, the Cronbach's alpha value was 0.880 for the treatment and service sub-dimension, 0.863 for the disease prevention/health promotion sub-dimension, and 0.927 for the overall THLS-32 scale (Okyay et al. 2016). In this study, it was 0.775, respectively; It was found as 0.773 and 0.871.

The Environmental Literacy Scale For Adults (ELSA): The ELSA was developed by Atabek-Yiğit et al. (2014) and has 20 items and three subdimensions named environmental consciousness, environmental anxiety and environmental awareness. It is a five-point Likert-type scale and consists of statements defined as "completely agree (5)" and "completely disagree (1)". The scores obtained from ELSA were ranked as follows in the evaluation n(1-100 points); 20-46 points as low environmental literacy, 47-73 points as moderate environmental literacy, and 74-100 points as high environmental literacy. In the study in which the scale was developed; the Cronbach's alpha value was found to be 0.881 (Atabek-Yiğit et al. 2014) and 0.912 in this study.

The prepared questionnaire was conveyed to students with the adaptation program (doc.google) through social media (WhatsApp) between 8-30 June 2020 and the students were asked to fill the questionnaire.

Data Evaluation

Data collected in the study were evaluated by the researcher using the IBM SPSS Statistics for Windows, version 20.0 on the computer. The number, percentage, mean, standard deviation descriptive statistics were used in the study. Kolmogorov-Smirnov test were used to determine whether the quantitative data were normally distributed. Independent sample t-test, one-way analysis of variance, Dunnet C Post Hoc test, Bonferroni Post Hoc test, were used to determine the differences between groups for normally distributed data. Correlation analysis test was performed for the correlation between the scales. In the evaluation of the correlation coefficients, if 0.00-0.25 is very weak, 0.26-0.49 weak, 0.50-0.69 moderate, 0.70-0.89 high and 0.90-1.00 was evaluated as a very high correlation (Erdogan et al., 2014). The statistical significance level was $p<0.05$.

Ethical Considerations

The study was reviewed and approved by Kafkas University Faculty of Health Sciences non-interventional clinical studies ethics committee on the session dated 08.06.2020 and numbered 81829502.903/49, and was conducted in compliance with the rules of the Declaration of Helsinki. The individuals to be included in the study were informed about the aim and motive of the study and were included in the study on voluntary basis, and only those who wanted to participate filled the questionnaire. No personal data was collected from the students participating in the study. Before starting the study, a section containing informed consent was created. Those who answered yes to this section were faced with the questions of the study.

Limitations and Strengths of the Study

This study has some limitations which were that the data were collected through social media due to the interruption of education and the results of the study can be generalized only to the students who studied at Kafkas University. The strengths of the study are that this is the first study in Turkey in terms of both the sample group and issues addressed and that the methodology is well-designed.

RESULTS

This study included migrant and nonimmigrant 860 students. 45.5% of the participants are immigrants and 54.5% are non-immigrant students. Of the immigrant students, 55% are male, 73.9% are between the ages of 18-25, 40.9% have spent most of their lives in the province, 56% are studying in undergraduate departments, 41.7% are university students. She is studying in the 2nd grade, 76% of the students are single, 41.5% have two children, 72.4% want to have a child in the future, 83.6% are not a member of any non-governmental organization, 73.1% are working 30.6% of them work in other sectors, 40.4% of them have an income between 1000-1999 TL, 35.3% of their mothers are high school graduates, 40.4% of their fathers are high school graduates, 48.6% are they consume 1.1-2 liters of water daily, 64.7% consume harmful substances, 49.1% smoke cigarettes, 42.5% have applied to a health institution 3-5 times in the last year. On the other hand, 57.3% of the immigrant students have been in Turkey for 4 or more years, and 46.3% of them stated that they studied in Turkey to get a better education.

Of the non-immigrant students, 57.8% are women, 75.9% are between the ages of 18-25, 42% have spent most of their lives in the province, 70.8% are studying in associate degrees, 43.3% is studying second in the classroom. 87% of the students are single, 41.9 % have two children, 83.2% want to have a child in the future, 89.8% are not a member of any non-governmental organization, 51.6% are not working, % 36.2% of them work in other sectors, 40.6% of them have an income of 500 TL or less, 36.2% of their mothers are primary school graduates, 39.4% of them are high school graduates, 46.3% of them are earning 0 per day. They consume between 1.0 liters of water, 76.5% do not consume harmful substances, 82.7% smoke cigarettes, 48.2% have applied to a health institution 1-2 times in the last year.

Immigrant students got 31.39±6.95 points from the treatment and service sub-dimension, 30.19±7.87 points from the disease prevention/health promotion sub-dimension, and 31.33±5.59 points from the THLS-32 total. Non-immigrant students got 18.35±10.21 points from the treatment and service sub-dimension, 19.90±11.15 points from the disease prevention/health promotion sub-dimension, and 18.62±9.68 points from the THLS-32 total. All of the students got 24.28±11.00

points from the treatment and service sub-dimension, 24.58±11.05 points from the disease prevention/health promotion sub-dimension, and 24.40±10.26 points from the total of THLS-32.

In total environmental literacy, immigrant students scored 71.00±15.39, non-immigrant students 78.53±9.30 and all students 75.11±12.99. Immigrant students scored 29.08±6.49 from Environmental Consciousness, 22.93±5.32 from Environmental Anxiety, and 35.11±3.71 from Environmental Awareness, which are environmental literacy sub-dimensions. Non-immigrant students scored 33.42±3.88 from Environmental Consciousness, 25.91±4.05 from Environmental Anxiety, and 35.20±2.62 from Environmental Awareness, which are environmental literacy sub-dimensions. All of the students got 31.45±6.66 points from Environmental Consciousness, 24.34±4.84 points from Environmental Anxiety, and 35.16±3.16 points from Environmental Awareness.

It was found that 60.1% of the immigrant students had insufficient or problematic/limited health literacy, and 39.9% had adequate and excellent health literacy. It was determined that 91.9% of the non-immigrant students had insufficient or problematic/limited health literacy, and 8.1% had adequate and excellent health literacy. It was found that 57.5% of the immigrant students had a medium level of environmental literacy and 77.2% of the non-immigrant students had a high level of environmental literacy (table 1).

Table 1. Students' Health Literacy and Environmental Literacy Levels (N=860)

	Immigrant Students		Non-Immigrant Students		Total	
Health Literacy	**n**	**%**	**n**	**%**	**n**	**%**
Poor Health Literacy	51	13.0	352	75.1	403	46.9
Problematic/Limited Health Literacy	184	47.1	79	16.8	263	30.6
Adequate Health Literacy	151	38.6	37	7.9	188	21.9
Excellent Health Literacy	5	1.3	1	.2	6	0.7
Environmental Literacy	**n**	**%**	**n**	**%**	**n**	**%**
Low Environmental Literacy	5	1.3	3	.6	8	0.9
Medium Environmental Literacy	225	57.5	104	22.2	329	38.3
High and Very High Environmental Literacy	161	41.2	362	77.2	523	60.8

Students got 24.4 points from THLS-32. The general score obtained from the prevention from diseases and health promotion subdimension was higher than the general score of the scale while the general score obtained from the treatment and

service subdimension was lower than the general score of the scale. The highest score was obtained from the understanding the health-related information subdimension while the lowest score was obtained from the accessing the health-related information subdimension (table 2).

Table 2. Mean and 95% Confidence Intervals of Index Scores of THLS-32 Matrix Components (N=860)

	Average Score	95% Confidence Interval	
THLS-32 Total Score	24.4	23.7	25.1
Treatment and Service	24.2	23.5	25.0
Access to Information	23.2	22.2	24.2
Understanding the Information	24.7	23.8	25.6
Evaluating Information	24.6	23.7	25.5
Using/applying Knowledge	24.2	23.2	25.1
Prevention and Health Promotion	24.5	23.8	25.3
Access to Information	23.3	22.3	24.3
Understanding the Information	23.7	22.8	24.7
Evaluating Information	24.5	23.5	25.4
Using/applying Knowledge	25.3	24.4	26.3
Accessing Health Information	23.3	22.4	24.2
Understanding Health Information	24.9	24.1	25.7
Assessing Health Information	24.6	23.8	25.4
Using/Practicing Health Information	24.8	24.0	25.6

While 22.6% of the students had a "sufficient or excellent health literacy level" on the total of THLS-32, this rate was 24.8% in the "treatment and service" subdimension and 27.2% in the "prevention from diseases and health promotion" subdimension. The "using/implementing the health-related information" subdimension had the highest rate while the "evaluating the health-related information" subdimension had the lowest rate (table 3).

Table 3. Categorical Frequency Distribution of Students in THLS-32 Matrix Components (N=860)

	Insufficient		Problem		Enough		Excellent	
	n	%	n	%	n	%	n	%
THLS-32 Total Score	403	46.9	263	30.6	188	21.9	6	0.7
Treatment and Service	437	50.8	210	24.4	177	20.6	36	4.2

Access to Information	512	59.5	89	10.3	178	20.7	81	9.4
Understanding the Information	512	59.5	89	10.3	178	20.7	81	9.4
Evaluating Information	505	58.7	88	10.2	180	20.9	87	10.1
Using/Applying Knowledge	527	61.3	60	7.0	187	21.7	86	10.0
Prevention and Health Promotion	433	50.3	193	22.4	203	23.6	31	3.6
Access to Information	533	62.0	69	8.0	175	20.3	83	9.7
Understanding the Information	522	60.7	73	8.5	179	20.8	86	10.0
Evaluating Information	522	60.7	73	8.5	179	20.8	86	10.0
Using/applying Knowledge	487	56.6	81	9.4	194	22.6	98	11.4
Accessing Health Information	496	57.7	128	14.9	173	20.1	63	7.3
Understanding Health Information	461	53.6	162	18.8	171	19.9	66	7.7
Assessing Health Information	463	53.8	162	18.8	184	21.4	51	5.9
Using/Practicing Health Information	454	52.8	165	19.2	183	21.3	58	6.7

As seen in table 4, the health literacy and subdimension scores of males from females, of immigrants from nonimmigrants, of undergraduate students from associate degree students, and of the second and third-grade students from the first-grade students were significantly higher. As daily water consumption of the students increased, their health literacy and subdimension scores increased while their environmental literacy scores decreased, and a statistically significant difference was found. The study found a statistically significant difference between the students' consumption of harmful substances and health literacy and subdimension scores and environmental literacy. The students who did not use any harmful substances had lower health literacy and higher environmental literacy compared to those who used harmful substances.

Table 4. Comparison of THLS-32 Total Scores, Sub-Dimensions and Total Environmental Literacy Scores According to Socio-demographic Characteristics of Students (N=860)

		THLS-32 Total Score		Treatment and Service Sub-Dimension		Prevention from Diseases/ Health Promotion Sub-Dimension		Environmental Literacy Total Score	
	N	X±SD	t-F/p	X±SD	t-F/p	X±SD	t-F/p	X±SD	t-F/p
Gender									
Woman	494	23.42±10.37	t=-3.262 **p=0.001**	23.21±11.08	t=-3.316 **p=0.001**	23.46±11.11	t=-3.465 **p=0.001**	75.19±12.90	t=0.214 p=0.824
Male	366	25.72±9.98		25.71±10.74		26.09±10.77		75.00±13.13	
Hometown									
Immigrant	391	31.33±5.59	t=22.942 **p<0.001**	31.39±6.95	t=21.434 **p<0.001**	30.19±7.87	t=15.324 **p<0.001**	71.00±15.39	t=-8.833 **p<0.001**
Non-Immigrant	469	18.62±9.68		18.35±10.21		19.90±11.15		78.53±9.30	
Working Status									
Working	513	25.28±10.09	t=3.072 **p=0.002**	25.28±10.96	t=3.286 **p=0.001**	25.75±10.99	t=3.791 **p<0.001**	75.12±13.47	t=0.036 p=0.972
Not Working	347	23.10±10.39		22.79±10.89		22.86±10.93		75.09±12.26	
Education Status									
Associate Degree	480	22.93±10.54	F=11.443 **p<0.001* 1<2**	22.65±11.11	F=12.535 **p<0.001** 1<2**	23.08±11.09	F=10.380 **p<0.001** 1<2**	75.75±12.34	F=1.862 p=0.156
License	346	26.19±9.64		26.19±10.54		26.56±10.68		74.08±13.73	
Postgraduate	34	26.91±9.29		27.80±10.22		25.63±11.16		76.52±13.78	
Reading Class									
1st Class	298	22.60±11.03	F=6.319 **p<0.001* 1<2,3**	22.19±11.48	F=6.953 **p<0.001* 1<2,3**	22.74±11.18	F=6.300 **p<0.001** 1<3,4**	76.65±11.34	F=3.770 **p=0.010** 4<1**
2. Class	366	24.73±9.96		24.71±10.77		24.75±11.07		75.10±13.49	
3rd Class	141	26.90±9.11		26.78±10.00		26.84±10.48		73.29±14.14	
4th Grade	55	25.57±9.20		26.25±10.46		27.66±10.00		71.49±13.94	
Daily Water Consumption									
Not Consuming	25	16.22±6.96	F=49.319 **P<0.001* 1,2<3,4,5**	15.86±7.75	F=40.265 **p<0.001* 1<3,4,5**	20.22±11.47	F=21.182 **p<0.001* 2<3,4,5**	73.52±8.81	F=5.972 **p<0.001* 5<2,3,4**
0-1 Liters	222	18.38±10.01		18.24±10.63		19.95±11.52		78.31±8.53	
1.1-2 Liters	366	25.24±10.08		25.30±10.93		25.08±10.74		74.44±13.80	
2.1-3 Liters	202	30.26±6.89		29.79±8.20		29.09±8.70		78.41±14.72	
3.1-4 Liters	45	25.54±8.96		25.66±9.38		25.55±11.34		70.97±15.05	
Harmful Substance Consumption									
Not Consuming	497	21.86±10.53	F=24.923 **P<0.001* 1<2,3,4,5**	21.72±11.02	F=23.534 **p<0.001* 1<2,3,4,5**	21.90±11.00	F=36.039 **p<0.001* 1<2,3,4,5**	78.81±10.98	F=88.324 **p<0.001* 2,3,4,5<1**
Cigaret	178	25.62±10.55		25.08±11.33		23.95±10.65		73.50±12.70	
Alcohol	86	30.16±4.59		30.49±6.22		33.25±6.30		60.22±5.96	
Drugs	50	30.65±4.87		30.80±6.30		32.66±6.98		60.48±5.60	
Cigarettes and Alcohol	49	29.27±8.34		29.78±10.53		30.61±9.01		66.32±14.14	

*: Dunnet C Test Applied. **: Bonferroni Test Applied. ***1,2,3,4,5: Represents the linear order of the data

A weak negative correlation was found between the health literacy scale and the total environmental literacy, environmental consciousness, and environmental

anxiety sub-dimensions ($p<0.05$). A very weak negative correlation was found between health literacy and environmental awareness sub-dimensions (table 5; $p<0.05$)

Table 5. Relationship between students' health literacy, subscale scores, and environmental literacy (N=860)

		(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
(I) THLS-32 Total Score	**r**	1	0.931**	0.626**	-0.285**	-.318**	-.293**	-.081*
	p		**0.000**	**0.000**	**0.000**	**.000**	**.000**	**.018**
(II) Treatment and Service Sub-Dimension	**r**		1	0.637**	-0.283**	-.311**	-.299**	-.075*
	p			**0.000**	**0.000**	**.000**	**.000**	**.027**
(III) Disease Prevention and Health Promotion Sub-Dimension	**r**			1	-0.476**	-.463**	-.452**	-.319**
	p				**0.000**	**.000**	**.000**	**.000**
(IV) Environmental Literacy Total Score	**r**				1	.924**	.909**	.829**
	p					**.000**	**.000**	**.000**
(V) Environmental Consciousness	**r**					1	.740**	.670**
	p						**.000**	**.000**
(VI) Environmental Anxiety	**r**						1	.674**
	p							**.000**
(VII) Environmental Awareness	**r**							1
	p							

*: Correlation is significant at the 0.05 level. **: Correlation is significant at the 0.01 level.

DISCUSSION

This study wasplanned to determine the health and environmental literacy levels of immigrant and nonimmigrant students who studied in a state university and relevant factors. The students' score on the THLS-32 was 31.33±5.59 (immigrant); 18.62±9.68 (nonimmigrant) and 24.40±10.26 (total). The mean general health literacy score in this study was lower than that in the studies conducted with a sample of students, and it was also insufficient (Güven et al., 2018; Malatyalı and Biçer, 2018; Şahinöz et al., 2018). According to Tanriover Dursun et al. and Okyay et al. found that general health literacy mean scores in adults were higher than in this study (Okyay et al., 2016; Tanrıöver Durusu et al., 2014). In a study conducted with 1000 people aged 15 and over in eight European countries (Sørensen et al. ., 2015) and a study with Ghanaian undergraduate students (Evans et al., 2019) revealed higher health literacy scores from our study. The reasons for this remarkable result might be that the concept is new, and healthy life and preventive health ser-

vices and culture is yet to be established, sample differences, and students mostly study in associate degree programs.

The students' mean score on the total environmental literacy was 71.00±15.39 (immigrant), 78.53±9.30 (nonimmigrant) and 75.11±12.99 (total). It was found that students who are immigrants have a medium level of environmental literacy, non-immigrants have a high level of environmental literacy, and all students have a high level of environmental literacy. In studies conducted with students from different departments, it was found that environmental literacy scores were higher than our study (Demirtaş et al., 2018; Deveci & Karteri, 2020; Duman & Yurtseven, 2022; Koç et al., 2018). At the same time, 60.8% of the students in this study have high or very high environmental literacy. Koç et al, conducted a study with 68 science teacher candidates and found that all teacher candidates had high and very high environmental literacy (Koç et al., 2018). Sampling differences such as environment-based courses that teacher candidates took and the fact that they will be role models for students and the fact that the student group in the present study was combined should be considered.

Of the students, 77.5% had insufficient or problematic/limited health literacy levels while 22.65 of them had sufficient or excellent health literacy levels (table 1). 79.2% of the students (Malatyalı and Biçer, 2018) in the studies conducted with the student sample; 58.9% (Uysal et al., 2020); 57.8% (Şahinöz et al., 2018); It was found that 44.3% (Güven et al., 2018) had insufficient or problematic/limited health literacy level.In the study by Evans et al. conducted with Ghanaian undergraduate students, 54.6% of the students had a limited health literacy level (Evans et al., 2019). Although the health literacy rates determined in the abovementioned studies are lower than that of the current study, they are similar to the current study based on the fact that more than half of the participants had an insufficient and problematic/limited health literacy level. In a study, which included eight European countries, 47.6% of the general population sample had limited health literacy (Sørensen et al., 2015). In a phone-based study by Duplaga conducted with 1000 Polish citizens, it was reported that 34.8% of the participants whose scores could be calculated had limited health literacy and that the students had limited health literacy than other professions (Duplaga, 2020). In a study conducted with 1650 participants in the countryside of Kazakhstan, the health literacy rate was problematic and insufficient (Shayakhmetov et al., 2020). Similar to the studies which reported lower health literacy levels, the present study revealed that the health literacy levels of the students were low.

The students who participated in the study got 24.4 points from the THLS-32. The general score obtained from the prevention from diseases and health promotion subdimension was higher than the general score of the scale while the general score obtained from the treatment and service subdimension was lower than the

general score of the scale. The highest score was obtained from the understanding the health-related information subdimension while the lowest score was obtained from the accessing the health-related information subdimension. Güven et al. found that the prevention from diseases and health promotion subdimension was lower than the general score and was higher than the treatment and service subdimension (Güven et al., 2018). The difference between the studies might be due to the differences in the sample and the number of students.

While 22.6% of the students had a "sufficient or excellent health literacy level" on the total of THLS-32, this rate was 24.8% in the "treatment and service" subdimension and 27.2% in the "prevention from diseases and health promotion" subdimension. In the study by Güven et al., the rate of students with a sufficient or excellent health literacy level higher in THLS-32 total and its subdimensions (Güven et al., 2018).

It was found that the health literacy and subdimension scores of male students were significantly higher than that of the female students. The studies in the literature found that women had higher health literacy than men (Güven et al., 2018; Levin-Zamir et al., 2016; Malatyalı and Biçer, 2018; Okyay et al., 2016; Ozen et al., 2019; Sørensen et al., 2015; Şahinöz et al., 2018; Uysal et al., 2020). The finding of the study might be correlated with the fact that the majority of the undergraduate students were male. Additionally, the fact that most of the students in the sample were female and lived in the eastern and southeast regions of Turkey where the status of women is low, mostly economic level is low and has a traditional social structure.

In the study, environmental literacy levels of non-immigrant students were found to be significantly higher than those of immigrants ($p<0.001$). In a study comparing Czech Republic and Turkish prospective teachers, no significant difference was found (Kroufek et al., 2015). The results are thought to be due to sample group differences and the inclusion of students studying in many different departments in this study.

It was found that the health literacy and subdimension scores of working students were significantly higher than that of the students who did not work. Despite being different measurement tools, in the studies by Levin-Zamir et al. (2016) and Zhang et al., (2016a; 2016b), the health literacy levels of individuals with good financial status were found to be higher. The study data are similar to the literature (Bakan and Yıldız, 2019; Ozen et al., 2019; Zhang et al., 2016a; 2016b).

The health literacy and subdimension scores of undergraduate students were significantly higher than that of the associate degree students while the health literacy and subdimension scores of the second and third-grade students were sig-

nificantly higher from the first-grade students. In the study by Evans et al., it was found that senior students had higher health literacy than junior students and it was emphasized that the fact that senior students' mean scores were higher was not remarkable since the health literacy was correlated with education level (Evans et al., 2019). Similarly, the health literacy scores of the individuals significantly increased as their grades increased in the studies by Güven et al, Ozen et al, and Levin-Zamir et al (Levin-Zamir et al., 2016; Güven et al., 2018; Ozen et al., 2019). The health literacy score increased as the school year increases, and this indicates that education may increase the health literacy between students during university education.

In this study, a significant difference was found between the class variable of the students and their environmental literacy levels ($p<0.05$). The environmental literacy level of the first-year students participating in the study was found to be higher and statistically significant than the fourth-year students. In a study conducted with middle school students using different measurement tools, they found that environmental behavior worsened as the school grade level of the students increased (Nourmoradi et al., 2021). There are studies reporting that younger students are more sensitive to the environment and exhibit positive behaviors towards the environment (Budak et al., 2005). In their study on the students of the Faculty of Sport Sciences, they found that the environmental literacy scores of the fourth grade students were significantly higher than the first and second grade students (Duman & Yurtseven, 2022). Kroufek et al., (2015) found that as the grade level of the student increases, the level of environmental literacy increases. It is thought that the differences between the studies, the sample, the time, the measuring tool differences, the status of the students taking environmental lessons or taking the environmental lessons competently are considered to be effective.

In this study, it was found that the environmental literacy of the students participating in the research was lower than those who consumed 3.1-4 liters of water significantly ($p<0.001$). Water, which is the most basic need for nature and the life of living things (Öztürk, 2016), is an indispensable element of vitality activities (Bulut & Şahin, 2022; Yılmaz & Yanarates, 2020). It is necessary for an individual to consume 2-2.5 liters of water per day in order to fulfill their bodily functions (Öztürk, 2016). In terms of environmental health, maintaining the cleanliness of water and using it consciously and economically are of great importance (Öztürk, 2016). The Organization for Economic Cooperation and Development expects household water consumption to increase by 130% by 2050 as the population increases (Kang, 2022; OECD, 2012). The fact that three quarters of the world is covered by seas should not mean that the amount of usable water is large. Approximately 97.5% of the water in the world is in the form of salt water in the seas and oceans, and only 2.5% of it is in the form of potable water (Bulut & Şahin, 2022; SPO, 2014). Less than 1% of the available water (accessible) are fresh water resources suitable for

use (Bulut & Şahin, 2022; Muluk et al., 2013). Despite this, people unconsciously use clean fresh water resources as if they will never run out (Bulut & Şahin, 2022; İlhan, 2011). It is reported that water scarcity will threaten Turkey in the near future, as in the rest of the world (Altinbilek and Hatipoglu, 2020). In this study, it was determined that the health literacy levels of the students who did not consume any water and consumed 0-1 liters of water were lower than those who consumed more water, and the individuals who consumed the required amount of water had the highest health literacy ($p<0.05$). According to our research findings, it can be said that university students are sensitive about water consumption in terms of health literacy and environmental literacy.

In this study, the health literacy of individuals who consumed harmful substances was found to be significantly higher than those who did not consume any harmful substance ($p<0.001$). Among the well-known subjective and objective determinants of health are smoking and alcohol (Alipbekova & Buleshov, 2021; Aubin, et al., 2021; Bobak, et al., 2000; Salgado, et al., 2020). Many studies have reported that poor health literacy is associated with poor health outcomes (Lindsey, et. al., 2021; Nutbeam, 2008; Nutbeam & Lloyd, 2020). In terms of our research findings, it is thought that it may be the result of three-quarters of the students having insufficient or problematic/limited health literacy. 76.5% of the students participating in the research do not use harmful substances, 62.5% of them smoke, which is a threat in terms of environmental pollution.

It was determined that the students who did not consume any harmful substance had statistically significantly higher environmental literacy than those who consumed harmful substances ($p<0.001$). In today's world, where environmental problems are increasingly felt, human activities have a great role in the formation of environmental problems. The conscious or unconscious pollution of the environment by human beings causes the problems to increase gradually. In this respect, it can be said that people have a great influence on the formation of environmental problems. Creating awareness about the environment and environmental values is of great importance in protecting the environment and leaving a healthy and reliable environment for future generations (Demirtaş et al., 2018; Duman & Yurtseven, 2022; Kayan, 2018). In a study that included nursing students, it was found that non-smoking nursing students had higher environmental awareness (Gök & Kiliç, 2021). In another study, non-smoking medical students were found to have positive environmental attitudes (Tamam et al., 2017). No study was found in which the consumption of harmful substances was compared using the ELSA Scale. Although the measurement tools used in environmental literacy are different, the statistically high environmental awareness and attitude of individuals who do not consume harmful substances is in line with the literature.

There were no significant differences between the environmental literacy scores and the students' sex, age, homeland, educational status, the place where they spent most of their lives, marital status, having children, wanting to have children in the future, being a member of a nongovernmental organization, the sector they work in, educational status of parents, applying to a health institution within the last year, duration of years in Turkey and the reason for being in Turkey. In the study by Koç et al., no significant differences between the students' sex, the place where they grew up and the environmental literacy was found (Koç et al., 2018). Similar to our study, it was found that age, department, where she spent most of her life (Demirtaş et al., 2018; Duman & Yurtseven, 2022), education level of parents and environmental literacy were found to be meaningless (Duman & Yurtseven, 2022).

A weak negative relationship was found between the health literacy scale and the total environmental literacy, environmental consciousness, and environmental concern sub-dimensions, and a very weak negative relationship with the environmental awareness sub-dimension ($p<0.05$). The unexpected result of our study is that as the students' health literacy increases, environmental literacy and environmental awareness, environmental anxiety and awareness of the environment decrease. Although there is no study that deals with both, the term environmental health literacy has emerged with the merger of health and environmental literacy (Cho et al., 2019; Corburn, 2007; Gray, 2018; Ramirez-Andreotta, et al., 2016; Shri & Tiwari, 2021). Finn and O'Fallon reported that, like the disease-specific nature of health literacy, an individual's environmental health literacy can vary from subject to subject (Finn & O'Fallon, 2017). Lindsey et al., on the other hand, argued that as long as environmental exposures represent health hazards in the physical environment, they overlap with health literacy and environmental health literacy (Lindsey, et. al., 2021). The public university where the study was conducted consists of students from many countries of the world, with different backgrounds, cultures and beliefs and exposed to different education systems. While the students had a high level of environmental literacy, they could not show the same sensitivity in health literacy. While the students participating in the research provide the development of environmental awareness and awareness studies through media or different methods, the same is not the case in terms of health.

CONCLUSIONS AND SUGGESTIONS

It was found in this study that most students had insufficient and problematic/limited health literacy and high environmental literacy. Additionally, it was found that the health literacy and subdimension scores of individuals who were immigrants, who worked, who had high education level and grade, who consumed daily water and who did not consume harmful substances were high while the environmental literacy levels of those who were nonimmigrant, who were first-gra-

de students, who consumed 0-1 liter water and who did not consume harmful substances were high. A weak negative correlation was found between health and environmental literacy.

Considering the results, it is suggested that from the first grade to the last year, taking into account the cultural differences of the students, the integration of the curricula to improve the health literacy of the students and the health-related education and the studies to increase the awareness of the students about health. More research should be conducted to reveal students' health and environmental literacy.

Acknowledgments and comments

The authors would like to thank all students who voluntarily participated in the research.

Conflict of interest

There is no conflict of interest between the authors.

Author contribution

Design of the Study: GG (50%), AÇ (50%)

Data Collection (Data Acquisition): GG (100%)

Data Analysis: GG (70%), AÇ (30%)

Article Writing (Writing Up): GG (70%), AÇ (30%)

Article Submission and Revision: GG (100%).

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