

Evaluation of the e-health literacy levels and related factors in vocational school of health services students

Sağlık hizmetleri meslek yüksekokulu öğrencilerinin e-sağlık okuryazarlık düzeyleri ve ilişkili faktörlerin değerlendirilmesi

Abstract

Aim: This study evaluated the e-health literacy levels and related factors in Vocational School of Health Services students.

Methods: It is a cross-sectional study conducted between January and February 2019 on 778 students studying at the Vocational School of Health Services in Elazığ. The research data were collected using the "Personal Data Form", and "e-Health Literacy Scale (eHEALS)". The data were evaluated in the Statistical Package for the Social Sciences (SPSS) 22.0 program, with $p < 0.05$ statistical significance. t-test, Pearson correlation analysis, one-way analysis of variance (ANOVA) and least significant difference (LSD) test were used for statistical analysis.

Results: The mean age of the students was 20.4 ± 2.6 , and 66.6% were women. The eHEALS score of the participants was 28.7 ± 6.92 . eHEALS scores were high in women, those with more monthly income, and those who lived in the city before the university ($p < 0.05$). There was a negative correlation between the total number of participants in the family, body height, weight, and eHEALS scores, and a positive low-level correlation between monthly income and eHEALS scores ($p < 0.05$).

Conclusion: It is important to have a high level of e-health literacy for the students who will be the health personnel of the future to fulfill their roles. It can be suggested that e-health literacy be included in the university curriculum.

Keywords: Health literacy; health personnel; student health service

Öz

Amacı: Bu çalışma, Sağlık Hizmetleri Meslek Yüksekokulu öğrencilerinin e-Sağlık okuryazarlık düzeylerini ve ilişkili faktörleri değerlendirmek amacıyla yapılmıştır.

Yöntemler: Elazığ ili Sağlık Hizmetleri Meslek Yüksekokulunda öğrenim gören 778 öğrenci üzerinde Ocak-Şubat 2019 tarihleri arasında yapılan kesitsel tipte bir çalışmadır. Araştırma verileri "Kişisel Veri Formu" ve "e-Sağlık Okuryazarlığı Ölçeği (eHEALS)" kullanılarak toplanmıştır. Verilerin değerlendirilmesinde Statistical Package for the Social Sciences (SPSS) 22.0 programı kullanılmış, $p < 0,05$ anlamlılık olarak kabul edilmiştir. İstatistiksel analiz için t-testi, pearson korelasyon analizi, one-way analysis of variance (ANOVA) ve least significant difference (LSD) testi kullanılmıştır.

Bulgular: Öğrencilerin yaş ortalaması $20,4 \pm 2,6$ olup %66,6'sı kadındır. Katılımcıların eHEALS puanı $28,7 \pm 6,92$ idi. eHEALS puanları kadınlarda, aylık geliri fazla olanlarda ve üniversite öncesi şehirde yaşayanlarda yüksekti ($p < 0,05$). Ailedeki toplam katılımcı sayısı, boy, kilo ve eHEALS puanları arasında negatif, aylık gelir ile eHEALS puanları arasında pozitif yönlü düşük düzeyde korelasyon saptanmıştır ($p < 0,05$).

Sonuç: Geleceğin sağlık personeli olacak öğrencilerin rollerini yerine getirebilmeleri için e-sağlık okuryazarlığının yüksek düzeyde olması gerekmektedir. E-sağlık okuryazarlığının üniversite müfredatına dâhil edilmesi önerilmektedir.

Anahtar Sözcükler: Sağlık okuryazarlığı; sağlık personeli; sağlık hizmetleri öğrencisi

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Received/Gelis : 04.06.2023

Accepted/Kabul: 13.08.2023

DOI: 10.21673/anadoluklin.1309670

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INTRODUCTION

The Internet is widely used as a source of information on many subjects today. The Internet offers several advantages, including quick, cost-effective, and anonymous access to information, making it a popular choice for searching for health information. Using the internet to search for health-related information can be an alternative to traditional methods, especially when access to a healthcare provider is limited (1).

The definition of e-health literacy is the ability to search, find, understand, and evaluate health information from electronic sources and apply the obtained health information to address or solve a health problem (2). It is a concept that focuses on the ability to obtain and apply online health information through electronic media (3). With the rapid development of information technologies, the use of electronic resources in health is increasing day by day. The Internet has become an important resource for searching health information (4). For example, when you type “cancer” on Google, more than 37 million results can appear. It has been determined that one out of every 20 searches made on Google is related to health. This shows the importance of e-Health literacy for people (5). Electronic information resources can help individuals improve themselves to promote healthy behaviors and physical health. Health information-seeking behavior has a positive impact on e-Health literacy (4). It is stated that people with a high level of e-Health literacy are more successful than other people in obtaining accurate information from reliable internet sources and in managing chronic diseases on their own (6,7).

e-Health literacy has been associated with a better understanding of more effective communication with the health care providers, better use of health insurance, and health management needs for a specific condition (8). It is also important in transforming health information into health promotion behavior (4). Research has shown that e-Health literacy has a positive impact on people’s physical activity, eating habits, and sleep (9). A low level of e-Health literacy is associated with a poor understanding of preventive health information and medical advice. Therefore, a low level of e-Health literacy may lead to decreased regular physician visits, increased length of stay and treatment costs, and increased morbidity and mortality (10).

Although there is a lot of health-related information on the Internet, some of this information contains false, misleading, or excessive technical information (11). Health students, health personnel, and individuals in the community should have a critical perspective on health information (12). University years are the most important period for health because desirable lifestyles and healthy behaviors can be easily adopted. Therefore, this period is very important to put health-promoting behavior into practice and to acquire life-long positive health behavior (13). Although university students frequently use information technologies, it is reported that they have difficulties in using and understanding online health information (14). In the literature, it has been observed that the perceptions and attitudes of this group, which uses the Internet quite frequently, are less known. It has been stated that university students need safe surfing on the internet for important health issues, and the results of false, misleading, and low-quality information on the internet will cause major problems (2).

This study was conducted to evaluate the e-Health literacy levels and related factors in Vocational School Health of Health Services students.

MATERIAL AND METHODS

Study Design

The population of the cross-sectional study consisted of students (N=840) studying at Firat University Vocational School of Health Services. The entire universe was included in the study without selecting a sample. 778 of the students included in the study (participation rate of the study 92.6%) were reached. Those who did not want to participate in the study and those who were absent were excluded. To observe the applicability and make the necessary changes, a preliminary application was made to 10 students. The study was carried out between January and February 2019. “Personal Data Form” and “e-Health Literacy Scale” were used to collect data in the research.

Personal Data Form

The form, which was created by the researchers by scanning the literature, consisted of 28 questions to determine the sociodemographic characteristics of

university students (age, gender, class, place of residence, mother and father's education, internet usage characteristics, etc.).

E-Health Literacy Scale

The eHealth Literacy (eHEALS: eHealth Literacy) Scale was developed by Norman and Skinner (2) in 2006 to describe traditional literacy, health literacy, information retrieval, scientific research, media literacy, and computer literacy. Turkish validity and reliability were done by Coskun and Bebis (15). The scale consists of 8 items measuring internet attitude. The scale uses the five-point Likert-type scaling method as "1= strongly disagree, 2= disagree, 3= undecided, 4= agree, 5= strongly agree". The lowest possible score is 8 and the highest is 40 points. A higher score indicates a high level of e-Health literacy.

Statistical Analyses

Statistical analyses of the data were evaluated in the SPSS Statistics for Windows (Statistical Package for the Social Sciences package program version 22.0, IBM Corp., Armonk, N.Y., USA), percentage, mean, t-test, one-way analysis of variance, post hoc least significant difference (LSD) test, and Pearson correlation analysis was used according to the characteristics of the variables. Means were demonstrated with standard deviation, and $p < 0.05$ was considered significant.

Ethical Considerations

This study was approved by the Inonu University Non-Invasive Clinical Research Ethics Committee (date: 18.12.2018, decision no: 2018/23-13). Written permission was obtained from the director of the vocational school of health services. In addition, the participants were informed about the study, and their written consent was obtained. The study followed ethical principles according to the Declaration of Helsinki.

RESULTS

The mean age of the participants was 20.4 ± 2.6 (min:17, max:43) and 66.6% (n=518) were women. 43.7% (n=340) of the participants were 17-19 years old, 54.5% (n=424) were in first grade, 69.5% (n=541) were in formal education, and 55.3% (n=429) were living

with their families. 24.3% (n=189) were medical imaging techniques, 23.1% (n=180) medical documentation and secretarial, 18.5% (n=144) medical laboratory techniques, 14.7% (n=114) physiotherapy, 12.2% (n=95) were in the anesthesia, 7.2% (n=56) were in the autopsy assistant department.

According to body mass index, 15.2% of the participants were underweight, 71.2% were normal, 11.5% were overweight, and 2.1% were obese. The distribution of the participants by sociodemographic characteristics is shown in Table 1.

The monthly income of the families of the participants was 2609.1 ± 1619.4 (min: 300, max: 15000) TL. 24.2% (n=188) of the students were smokers, and the average number of cigarettes smoked by the students per week was 96.7 ± 66.6 (min:3 max:315). 82.9% of the participants were accessing the internet from their mobile phones and 45.6% were using the internet for 1-3 hours a day (Table 2).

95.8% (n=745) of the participants were using the internet every day, and 18.3% (n=142) were doing health-related research on the Internet in the last week. Participants' eHEALS scores were 28.7 ± 6.9 (min:8, max:40). eHEALS scores were found to be significantly higher in women, those with formal education, those with a high monthly income, and those who lived in the city before university ($p < 0.05$, Table 3).

The eHEALS scores of the participants were not changed according to their working status, chronic disease status, and physical activity level ($p > 0.05$, Table 4).

The distribution of the eHEALS scores of the participants according to the internet-related variables is shown in Table 5. The scores of the participants who stated that it is very important to access health resources on the Internet were significantly higher ($p < 0.05$).

There was a negative correlation between the total number of individuals in the family, body height, weight, and eHEALS scores, and a low-level positive correlation with monthly income and eHEALS scores ($p < 0.05$, Table 6).

DISCUSSION and CONCLUSION

In this study, the mean eHEALS score of the participants was found to be 28.7 ± 6.9 . The mean eHEALS scores were as follows: 25.9 ± 0.2 in western Turkey

Table 1. Distribution of participants by sociodemographic characteristics

Sociodemographic characteristics	n	%
Gender		
Woman	518	66.6
Man	260	33.4
Mother education level		
Literate	190	24.4
Elementary education graduate	342	44.0
Secondary school graduate	130	16.7
High school graduate	90	11.6
University graduate	26	3.3
Father education level		
Literate	32	4.1
Elementary education graduate	253	32.7
Secondary school graduate	196	25.3
High school graduate	199	25.7
University graduate	94	12.2
Working status in a job		
Yes	106	13.6
No	672	86.4
Place of residence before university		
City	504	64.9
County	147	19.0
Village	125	16.1
Chronic disease		
Yes	58	7.5
No	716	92.5
Perception of health status		
Good	444	57.5
Moderate	300	38.9
Bad	28	3.6
Physical activity level		
Very low	83	11.0
Low	277	36.7
Moderate	222	29.4
High	173	22.9
Regular breakfast habit		
Yes	375	48.4
No	400	51.6
Perception of nutritional status		
Very good	64	8.3
Good	514	66.4
Bad	171	22.1
Very bad	25	3.2

n: Number, %: Percent

Table 2. Distribution of participants according to their internet usage characteristics

Internet usage characteristics	n	%
Internet access*		
Mobile phone	645	82.9
Home	318	40.9
University	85	10.9
Dorm	49	6.3
Internet cafe	46	5.9
Purpose of internet use*		
Social network	641	82.3
Information	518	66.5
Game	189	24.3
Music-movie	22	2.8
Daily internet use		
Less than 1 hour	79	10.2
1-3 hours	351	45.6
4-7 hours	223	29.0
8 hours or more	117	15.2
Type of health-related information searched on the Internet*		
Disease	301	38.7
Healthy lifestyle	287	36.9
Treatment	224	28.8
Medicine	106	13.6
Health personnel	85	10.9

n: Number, %: Percent * One person answered more than once.

(16), 26.2±7.3 in Cyprus [14], 28.7±5.3 in Iran (9), 29.4±4.3 in eastern Turkey (5), 31.0±4.3 in Canada (17). In our study, it was observed that the eHEALS scores of the participants were above average.

In this study, women's eHEALS scores were found to be significantly higher. Ozkan et al.'s study was also similar to our study (6). In the literature, there were also studies in which there is no significant relationship between gender and e-health literacy (12,16,18). This may be due to the difference in sample groups.

Participants aged 23 and over had high eHEALS scores and were not statistically significant. In a study conducted in a province in the east of Turkey, the eHEALS scores of students aged 24 and above were found to be significantly higher (5). There were also studies in the literature that do not have a relationship between the age variable and eHEALS scores (16,19). E-Health literacy can be affected by many factors such as age, environment, and sociocultural status.

Table 3. Distribution of eHEALS scores according to participants' sociodemographic characteristics

Sociodemographic characteristics	n	eHEALS Score (Mean±SD)	Statistics	p
Gender				
Woman	511	29.17±6.48	t=2.431	0.015
Man	260	27.83±7.65		
Age				
17-19	338	28.38±6.96	F=0.768	0.464
20-22	325	28.91±6.97		
≥23	108	29.19±6.65		
Body mass index				
Weak	119	28.64±7.02	F=0.563	0.640
Normal	547	28.76±6.99		
Overweight	88	28.95±6.48		
Obese	16	26.56±6.32		
Class				
1	420	28.51±7.21	t=-0.902	0.367
2	351	28.97±6.55		
Form of education				
Formal education	538	29.08±6.64	t=2.099	0.036
Secondary education	233	27.89±7.48		
Department				
Anesthesia	95	30.43±6.63*	F=4.513	0.0001
Physiotherapy	114	30.20±5.75*		
Autopsy assistant	56	30.36±5.47*		
Medical imaging techniques	186	27.68±7.81		
Medical laboratory techniques	142	27.80±6.47		
Medical documentation and secretarial	178	28.17±7.17		
Mother education level				
Literate	187	27.23±7.01*	F=2.940	0.020
Elementary education graduate	339	29.30±6.52*		
Secondary school graduate	130	29.05±7.20		
High school graduate	89	29.02±7.42*		
University graduate	26	29.12±7.10		
Father education level				
Literate	31	27.45±7.16	F=1.935	0.103
Elementary education graduate	250	28.25±6.91		
Secondary school graduate	194	28.39±6.73		
High school graduate	199	29.11±7.18		
University graduate	93	30.24±6.64		
Monthly income (Turkish Lira)**				
≤1600	223	27.93±6.99	F=6.073	0.002
1601-3000	346	28.53±6.77*		
≥3001	184	30.22±6.68*		

n: Number, SD: Standard deviation, %: Percent, t = t test value, F= One-way analysis of variance test value

*The groups where the difference originates according to the post hoc LSD test

** The minimum wage at the time of the research was 2020 Turkish lira.

Table 4. Distribution of participants' eHEALS scores according to various variables

Variables	n	eHEALS Score (Mean±SD)	Statistics	p
Working status in a job				
Yes	106	29.02±7.91	t=0.427	0.670
No	665	28.67±6.75		
Place of residence at the time of study				
With friends/single at home	108	29.11±7.31	F=2.765	0.064
With family	425	29.09±6.83		
Dorm	236	27.83±6.86		
Place of residence before university				
City	501	29.18±6.85*	F=4.285	0.014
County	146	28.39±7.29		
Village	122	27.19±6.61*		
Smoking status				
Yes	187	28.73±7.59	F=0.792	0.453
Quit	67	27.72±6.72		
No	517	28.85±6.69		
Chronic disease				
Yes	58	29.07±6.11	t=0.390	0.696
No	709	28.70±6.99		
Perception of health status				
Good	440	29.04±6.94	F=2.195	0.112
Moderate	297	28.44±6.83		
Bad	28	26.46±7.56		
Physical activity level				
Very low	83	28.45±7.25	F=1.840	0.138
Low	275	28.45±6.45		
Moderate	218	28.41±6.87		
High	173	29.83±7.30		
Regular breakfast habit				
Yes	370	29.06±6.72	t=1.298	0.195
No	398	28.42±7.02		
Perception of nutritional status				
Very good	64	30.67±7.00*	F=3.422	0.017
Good	509	28.70±6.84		
Bad	169	28.61±6.65		
Very bad	25	25.64±8.22*		

n: Number, SD: Standard deviation, %: Percent, t = t test value, F= One-way analysis of variance test value

*The groups where the difference originates according to the post hoc LSD test.

Overweight participants had high eHEALS scores and were not statistically significant. In a study conducted in Japan (20), the risk of being overweight was found to be higher in those with high eHEALS scores (OR 1.49, $p < 0.001$). Studies in adolescents have shown that low e-health literacy levels were associated with obesity (21).

The eHEALS scores of the participants studying in the second (last) year were high but not significant. In studies conducted with faculty students, the scores of students in the last year were significantly higher (5,22). There were also studies in the literature in which the eHEALS scores of students do not differ according to the class they study (12,16). It can be thought that

Table 5. Distribution of participants' eHEALS scores according to internet-related variables

Internet-related variables	n	eHEALS Score (Mean±SD)	Statistics	p
Internet usage frequency				
Every day	738	28.76±6.81*		
Few days a week	31	28.81±8.40	F=6.295	0.002
None	2	11.50±4.95*		
Daily internet use				
Less than 1 hour	78	27.38±7.61		
1-3 hours	347	28.55±6.91	F=2.089	0.125
4 hours or more	338	29.12±6.78		
Status of doing health-related research in the past week				
Yes	141	29.33±6.72	t=1.127	0.260
No	626	28.60±6.93		
How useful is the internet in making decisions about your health?				
Very useful	54	30.04±9.41*		
Useful	303	30.09±6.83		
Undecided	272	27.88±5.96*	F=7.763	0.0001
Not useful	96	27.51±6.75		
Not useful at all	46	25.63±7.71*		
How important is it to you to have access to health resources on the Internet?				
Very important	117	30.42±8.52		
Important	358	29.27±6.46		
Undecided	169	27.80±6.16	F=7.130	0.0001
Not important	98	27.53±6.46		
Not important at all	28	24.11±8.12		

n: Number, SD: Standard deviation, %: Percent, t = t test value, F= One-way analysis of variance test value

*The groups where the difference originates according to the post hoc LSD test

Table 6. Correlation analysis of participants' eHEALS score according to various variables

Variables (n=778)	eHEALS score	r*	p
Age		0.062	0.086
Total number of individuals in the family		-0.118	0.001
Body height		-0.095	0.008
Weight		-0.092	0.010
BMI		-0.052	0.151
Monthly income		0.110	0.003

BMI: Body mass index, n: Number, *Pearson correlation analysis

eHEALS scores will increase as the health-related education period of individuals increases.

The eHEALS scores of the participants studying in the anesthesia department were found to be significantly higher. eHEALS scores were significantly higher in physical therapy students in a study in Turkey, in medical students in a study in Iran, and in nursing stu-

dents in a study in South Korea (10,12,19). This may be due to the difference in sample groups.

Participants whose mothers were primary school graduates had significantly higher eHEALS scores. Sengul et al.'s study, the eHEALS scores of the students whose mothers were primary school graduates were high but not significant (22). Ergun et al.'s study,

the scores of individuals whose mothers were university graduates were significantly higher (16). Eyimaya et al.'s study, the scores of those whose mothers were secondary school graduates were significantly higher (23). Cetinkaya et al.'s study, no relationship was found between maternal education level and eHEALS scores (5). Considering the effects of women, who form the basis of the family, on the health of family members, it can be thought that the development of women's e-Health literacy will be meaningful in terms of public health promotion strategies.

The eHEALS scores of the students whose fathers were university graduates were high but not significant. Sengul et al.'s study, students whose fathers were primary school graduates had higher eHEALS scores but were not significant (22). There were also studies in the literature that did not find a significant difference between the father's education level and eHEALS scores (5,16).

As the monthly income level increased, the eHEALS scores of the participants also increased significantly. The study of both Ergun et al. and Ozkan et al. was similar to our study (6,16). In the study of Tosun and Hosgor, the scores increased as the monthly income increased, but it was not significant (24). In another study, no correlation was found between income status and eHEALS scores (22). It is thought that the high monthly income provides the opportunity to provide individuals with more opportunities in many aspects, especially in terms of access to the internet, and therefore it may be effective in e-Health literacy.

Participants working in a job had high eHEALS scores but were not significant. In the literature, there were studies in which the scores of working students were found to be significantly higher (5,6). It can be thought that the increase in socioeconomic opportunities and internet access will increase with the student's working in a job.

The eHEALS scores of students living alone/with friends at home had high scores but not significantly. Similarly, in Turan et al.'s study, the scores of individuals living with their families had high scores but not significantly (25). In Sengul et al.'s study, the eHEALS scores of those staying in student housing were found to be statistically significantly higher (22). This situation may be due to the difference in sample groups.

Participants residing in the city before the university had statistically significantly higher eHEALS scores. Ozkan et al.'s study and Ergun et al.'s study, the scores of those living in the city were also significantly higher (6,16). Cetinkaya et al.'s study, the scores of those residing in the city center were high but not significant (5). This may be due to the excess of social development opportunities in the living spaces of those living in the city center.

The eHEALS scores of non-smokers were high but not significant. Ozkan et al.'s study was also similar to our study (6). Tsukahara et al.'s study, there was no relationship between smoking and eHEALS scores (20). The fact that non-smokers pay more attention to their health may be effective in this.

eHEALS scores were high but not significant in patients with chronic disease. Cetinkaya et al.'s study was also similar to our study (5). In the literature, the scores of those without chronic disease were found to be significantly higher (8,24). Ergun et al.'s study, the eHEALS scores of those with chronic diseases were significantly higher (16). There were also studies in the literature in which no difference was found between chronic disease and eHEALS scores (6).

The eHEALS scores of the participants who perceived their health status as good were high but not significant. Hong et al.'s study, those who perceived their health status as good had significantly higher scores (12). In Tosun and Hosgor's study, the scores of those who perceived their health status as very good were significantly higher (24). It can be thought that those with good health should research more health-promoting situations from online health resources, which may lead to this situation.

The eHEALS scores were higher in those with higher physical activity levels but not significant. Studies conducted with university students in both Japan and the USA showed that participants in the high eHEALS score group have a healthier lifestyle (20,26).

Participants who regularly ate breakfast had higher eHEALS scores but it was not statistically significant. In a Japanese study, those who regularly ate breakfast had significantly higher eHEALS scores. In a study conducted with university students in Japan, the scores of those who regularly had breakfast were found to be significantly higher (20). Eating breakfast regularly

can be an indicator of an overall healthy lifestyle. In our study, the eHEALS scores of those who perceived their nutritional status as very good were statistically significantly higher. This finding is consistent with studies with American and Taiwanese university students (26,27).

Participants who never used the Internet had significantly lower eHEALS scores. Cetinkaya et al.'s study, eHEALS scores were not changed according to the frequency of internet use (5,19). Since electronic health literacy requires access to electronic health resources, it is an expected result that the eHEALS scores of those who never use the Internet are low.

The eHEALS scores of those using the Internet for 4 hours or more per day are higher, but not significantly. In Tosun and Hosgor's study, the eHEALS scores of those who used the internet for four hours or more per day were significantly higher (19). Ergun et al.'s study, the eHEALS scores of those who used the Internet for 2-3 hours a day were significantly higher (16). Sengul et al.'s study, no significant difference was found between the duration of daily internet use and eHEALS scores (22).

The eHEALS scores of the participants who thought that the internet was useful in making health-related decisions and that it was very important to access health resources on the internet were found to be statistically significantly higher. The literature was also compatible with our study (16,25). It can be thought that university students have a high level of knowledge due to their access to health resources from the internet.

In addition to determining e-health literacy levels, examining the relationship with various variables is one of the advantages of this study. When e-health literacy levels are examined in the literature, it has been determined that few studies have been conducted in our country.

The study has some limitations. The study was carried out only in a single university health services vocational school in eastern Turkey. In addition, due to the nature of cross-sectional studies, it is not possible to precisely determine the cause-effect relationship.

As a result, the eHEALS mean score of the participants in our study was found above the average. The eHEALS scores were found to be significantly higher in women, those with formal education, those with a

high monthly income, and those who lived in the city before university. eHEALS scores were not changed according to age, body mass index, smoking status, chronic disease, and physical activity level. There was a negative correlation between the total number of individuals in the family, height, weight, and eHEALS scores, and a positive low-level correlation between monthly income and eHEALS scores. It is important that students who will work as health educators and consultants in their professional fields and who will be health workers of the future have good e-health literacy levels to fulfill these roles. For this reason, it is suggested that the subject of e-health literacy be included in the undergraduate curriculum. Students can be instructed on how to access reliable health information from online sources.

Acknowledgments

We are particularly grateful to all participants in this study.

Conflict-of-Interest and Financial Disclosure

The authors declare that they have no conflict of interest to disclose. The authors also declare that they did not receive any financial support for the study.

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