Evaluation of E-health literacy in Paramedicine and Health and Nutrition students of Lorestan University of Medical Sciences

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ABSTRACT

Background and Objective: There is a gap between access to eHealth resources and the skills of consumers to use them, which can help to provide quality eHealth by identifying these skills. The aim of this study was to determine the electronic health literacy score of Lorestan University of Medical Sciences students in 2018.

Materials and Methods: This descriptive-analysis study was conducted on students of the faculties of Paramedicine, Health and Nutrition at Lorestan University of Medical Sciences in the first semester of 2018-2019. The sampling method was stratified random in proportion to the volume was employed. Data were collected using a questionnaire, which consisted of five parts (Demographic Characteristics, Educational Features, Internet usage questions, The eHealth Literacy Scale (eHEALS) Questions). The Content validity of questionnaire was assessed in an interview with 3 health education experts and 4 health information experts. The reliability of the questionnaire was assessed using Cronbach's alpha (overall Cronbach's alpha was 0.89) Data analysis was conducted with SPSS version 21 statistic software package and descriptive statistics, independent t-test, Pearson correlation coefficient, ANOVA and Duncan's post hoc tests.

Results: According to the results of this study, the students had a good level of health literacy. There is also a significant difference between the level of health literacy of those access the Internet outside the faculty and those do not ($p<0.05$). In addition, the most common place to use the Internet was the dormitory (% 43.8).

Conclusion: Planning for more to access the Internet outside of faculty for the students, especially in dorms, can help to improve students' health literacy. In addition, conducting workshops on how to search for electronic health information as well as introducing reliable sources and databases can be effective in enhancing students' health literacy.

Paper Type: Research Article
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Introduction

"Health literacy refers to a person's capacity to acquire, process, and understand basic health information and services needed to make appropriate health decisions" (1). The subject of health literacy and E-health literacy are closely related in the field of public health, so that E-health literacy is part of health literacy (2). E-health literacy is a new concept involved in improving the results of information searches, better self-management of health care needs and more interaction with physicians (3, 4). Norman and Skinner define E-health literacy as: "E-health literacy refers to a person's ability to search, find, understand, and evaluate health information from electronic sources and use such knowledge to address or solves health problem" (5).

Meanwhile, the Internet is an important source of health information for the general public (6) and its use in the field of health requires a certain level of E-health literacy (5). There is a gap between access to electronic health resources and consumer skills to use them, and by identifying and understanding this set of skills, it is better to address the issue of providing e-health services. To bridge this gap, e-health needs to realize its potential to improve people's health (5). Inadequate health literacy increases the inefficiency of health care, and illiterate people use less preventive services and information technology, and are more exposed to emergency use, poor overall health, and higher risk of death (7).

Effective Internet searches are important for locating health information, especially for students. Students' access to much of existing health information does not guarantee their search for health information on the Internet (8). External Research has found that in adults (8) and in people with limited educational characteristics, low computer knowledge and low Internet experience, the level of E-health literacy is low. Other research on students found that many lacked E-health literacy skills (9). In Iran, a study aimed at determining the status of E-health literacy in graduate students found that the average E-health literacy score of the study population was higher than the average E-health literacy score (10). On the other hand, in the study of Dashti et al., the study of E-health literacy of students showed that the level of E-health literacy of the studied students was lower than the students of other countries (11).Therefore, considering the importance of E-health literacy in students better self-management and greater utilization of available electronic health resources and improving the overall health status, the present study aimed at determining the students' E-health literacy score of Paramedicine School and Lorestan University of Medical Sciences in 2018. It should also be noted that the students' e-health literacy score was evaluated using The eHealth Literacy Scale (eHEALS), which has not been used in Iran so far. In addition, because young people are thought to need high levels of access to E-health literacy and familiarity with information technology tools, this study identifies the group of students as the research community. It is hoped that the results of this study can help improve the level of E-health literacy and increase the tendency to use digital technology and the Internet for health-related purposes and health care.

Materials and Methods

The present study was a cross-sectional descriptive analytical study. The research population included all students studying in Paramedicine and health and nutrition faculties of Lorestan University of Medical Sciences in the first semester of

the 2018-19 academic year (981 people). In order to determine the sample size and achieve maximum accuracy and generalizability of the results, stratified random sampling method was used in proportion to the volume (based on the field of study). In this way, Paramedicine and health and nutrition faculties were considered as strata and fields of study in each faculty as subclasses, and the samples were randomly selected according to the number of students in each field of study. The number of samples was calculated through the Cochran's formula with an error value of 0.06, which was at least 148 people selected due to the possible drop of 180 students. The questionnaire used in this study consisted of five sections: demographic specifications (8 items), educational features (6 items), descriptive questions related to the general use of the Internet (4 questions), descriptive questions related to the use of the Internet in the field of health (6 questions) and eHealth Literacy Scale (eHEALS) questions.

The eHEALS consists of 8 items, using a 5-point Likert scale from "completely disagree" to "completely agree". The overall score of this tool was from 8 to 40, which according to previous studies, health literacy score of more than 27 indicates high literacy level and 27 and below it indicates low literacy level (12). Higher scores indicate that E-health literacy has a higher self-perception.

E-health was developed by Norman and Skiner to determine users' comprehensible skills in finding, evaluating and using health information to solve health problems, and is the only tool that measures the health skills of Internet users (13, 14). Its validity has been confirmed by experts (14) and students (12) and it has been recommended as a tool for assessing customer comfort and skill in the use of information technology for health (17). The reliability of this tool has been confirmed using Cronbach's alpha coefficient (a>0. 86) (12-14) as well as the test retest method (13) based on previous studies.

In the present study, the validity and reliability of the Persian version of E-health were evaluated. The formal validity of the Persian version of this tool was confirmed through forward and backward translation into Persian and vice versa, based on the WHO model of English to Persian translation, Persian to English translation using a group of experts, pre-tests and cognitive interviews. Moreover, the validity of the content of this version was confirmed by experts in the field of health promotion (3 people) and health information technology (4 people). Its reliability was also confirmed by Cronbach's alpha of 0.89. The questionnaire was simultaneously provided to the students participating in the study and was self-reported. Students were asked to register their student number if they wished, of which 37 enrolled. Therefore, according to the self-report of the GPA(Grade point average) by the students, in order to verify them (GPA of the previous semester, GPA), the GPA of the students who registered their student number was compared with the GPA registered in the Educational Management System (Sama). Its compliance rate was calculated to be 83%.

This level of conformity indicates the approval of the GPA recorded by the students. Finally, the data were analyzed using descriptive statistics and independent t-tests, one-way analysis of variance analysis, Duncan's follow-up test and Pearson correlation coefficient using the spss statistical software version 21. The significance level in this study was 0.05.

Ethical considerations:

Necessary permits were obtained to collect the data for the present study. Furthermore, the satisfaction of the study population was obtained to participate in the study. In addition, the anonymity and non-disclosure of the identity of the students

participating in the study were observed.

Results

The findings showed that out of 180 questionnaires distributed among the students studied, 160 questionnaires were completed and returned. Therefore, the response rate of the study population was 88.88%. The demographic characteristics of the study population are shown in Table 1

Table 1: Frequency distribution of demographic characteristics in the study population

Demographic variable		N(Percentage)	Educational variables		N(Percentage)
Gender	Male	96(60%)	field of study	Health Information Technology	16(10%)
	Female	64 (40%)		Radiology	16(10%)
Marital status	divorced	1(6%)		Anesthesiology	(14.4%) 23
	Single	138(86%.3)			
	Married	21(13.1%)		Nutrition	(8.8%) 14
Employed (student)	Yes	145(90.6%)		Operating room	(13.1%) 21
	No	15(9.4%)		Emergency Medicine	(10%) 16
Father's education level	Illiterate	32(20%)		Environmental Health	19(11.9%)
	High school	50(31.3%)			
	Diploma	33(20.6%)		Occupational Health	6.9%)) 11
	Associate - Bachelor	40(25%)			
	Master - PhD	5(3.1%)		Public Health	(15%) 24
Mothers education level	Illiterate	43(26.9%)	faculty	School of Health	(42.5%) 68
				Paramedical Sciences	(57.5%) 92
	High school	63(39.4%)	Degree	Associate Degree	(10%) 16
				Bachelor	(88.8%) 144
				Master	(1.3%) 2
	Master - PhD	1(6%)	University entry year	2015<	(22.5) 36
				2016	(31.3%) 50
				2017	(28.1%) 45
				2018	(18.1%) 29
Father's job	Manual worker	19(%11.9)	University GPA (Score of 20)	12	(%6) 1
				13	(6%) 1
				14	(404%)7
	Employee	52(%32.5)		15	(16.9%) 27
	self-employment	73(%45.6)		16	(29.4%) 47
				17	(26.3%) 42
	Others	13(%8.1)		18	(13.8%) 22
				19	(8.1%) 13
Mother's job	Housewife	141(%88.1)	High school GPA (Score of 20)	13	0%.6)) 1
				14	(3.8%) 6
				15	(8.1%) 13
				16	(16.3%) 26
				17	(18.8%) 30
				18	(33.1%) 53
	Employed	19(%11.9)		19	(18.8%) 30
				20	(0%.6) 1

According to Table 2, there was no significant relationship between any of the demographic characteristics and E-health literacy score (p <0.05).

Table 2: Comparison of E-health literacy score according to demographic variable

Demographic variable		E-health literacy score Mean ± SD	P Value
Gender	female	27.29±5.08	0.379
	Male	27.96±4.21	
Marital status	single	27.32±4.94	0.134
	Married	29.00±3.10	
Employed	Yes	27.93±5.09	0.752
	No	27.52±4.73	
Father's education level	Illiterate	26.55±6.11	0.297
	High school	28.20±3.83	
	Diploma	27.97±3.66	
	Associate - Bachelor	26.80±5.63	
Mother's education level	Illiterate	26.62±5.56	0.521
	High school	28.24±4.52	
	Diploma	27.54±4.41	
	Associate - Bachelor	27.48±4.63	
Father's job	Manual worker	25.73±7.26	0.327
	Others	28.53±5.20	
	self-employment	27.58±3.72	
	Employee	27.80±4.81	
Madder's job	Housewife	27.53±4.68	0.865
	Employed	27.73±5.83	

Based on the findings (Table 3), there was no significant relationship between the academic characteristics of the students participating in the study (field of study, faculty, degree) and their E-health literacy score (p <0.05). Moreover, the comparison of the E-health literacy score with the year of entry, which was done by comparing pairs between groups, showed a significant difference between the students of 2016 and 2018, but there was no significant difference between the other groups (P <0.05). In addition, the correlation coefficient between E-health literacy score with total grade point average, diploma grade point average and age were 0.14, 0.77 and 0.12, respectively, which were statistically not significant (p <0.05).

Findings in Table 4 showed that 78.8% of the study participants had access to the Internet in the faculty and 74.4% outside the faculty. Also, the highest percentage of study participants (24.4) reported internet usage between 1-2 hours per day. In addition, 43.8% of students had the most Internet use in the dormitory.

Table 3: Comparison of eHEALS according to educational variables

Educational variables		eHEALS Mean ± SD	P Value
field of study	Health Information Technology	27.43±5.18	0.758
	Radiology	26.93±4.34	
	Anesthesiology	26.39±5.40	
	Nutrition	27.50±5.27	
	Operating room	27.42±4.80	
	Emergency Medicine	29.06±2.61	
	Environmental Health	27.21±6.40	
	Occupational Health	27.18±4.35	
	Public Health	28.19±3.55	
faculty	School of Health	27.36±4.64	0.552
	Paramedical Sciences	4.91 ± 27.82 27.82±491	
degree	Associate Degree	29.37±2.52	0.108
	Bachelor and Master	27.36±4.90	
University entry year	2015<	26.83±5.55	0.032
	2016	27.1±4.23	
	2017	27.15±4.34	
	2018	29.89±4.63	

Table 4: Distribution of questions related to general use of the Internet in the field of health

General use		N(Percentage)
Inside the faculty	Yes	126(73.8%)
	No	34(21.3%)
Outside the faculty	Yes	119(74.4%)
	No	41(25.6%)
Rate of usage	I do not use	13(81%)
	Less than 1 hour	37(23.1%)
	1-2 hours	39(24.4%)
	2-3 hours	29(18.1%)
	3-4 hours	15(9.4%)
	More than 4 hours	27(16.9%)
Place of use	IT University	22(13.8%)
	Dormitory	70(43.8%)
	Home	16(10%)
	Using mobile everywhere	52(23.5%)

According to the results of the study (Table 5), no significant relationship was found between the General use of the Internet (Internet access within the faculty, the rate of Internet use) and E-health literacy score ($p < 0.05$). However, there was a significant difference between those who have access to the Internet outside of faculty and those who do not have access to the Internet outside of faculty ($p < 0.05$). Regarding the E-health literacy score in terms of Internet usage, paired comparison between groups showed that the difference between dormitory and university was significant, but there was no significant difference between other groups ($p < 0.05$). In addition, the relationship between E-health literacy score and Internet usage ($p = 0.06$, $p = 0.15$) was not statistically significant.

Table 5: Comparison of E-health literacy scores according to questions related to the general use of the Internet in the field of health

General use		eHEALS Mean ± SD	P Value
Inside the faculty	Yes	27.67±4.55	0.567
	No	27.14±5.47	
Outside the faculty	Yes	28.19±3.98	0.4
	No	25.73±6.18	
Place of use	IT University	24.81±5.85	0.22
	Dormitory	28.24±4.28	
	Home	28.56±3.48	
	Using mobile everywhere	27.5±4.86	

Table 6 showed that students often use health to access disease and treatment information (91.9% and 90%, respectively). However, 46.3% of the study participants never used the Internet in the field of health to receive guidance and counseling.

Table 6: Distribution of the number of respondents who ever have searched for health information

Use in health		N(Percentage)
Access for	Disease information	147(91%1.9)
	Lifestyle information	138(86.2%)
	Drug information	140(87%.5)
	Treatment information	144(90%)
Health care		180(67 %.1)
Consulting		86(53%.7)

Table 7: Frequency distribution of questions related to the use of the Internet to access health information

Question	strongly disagree	disagree	No idea	agree	strongly agree
I know what health resources are available on the Internet	5(3.1%)	11(6.9%)	72(45%)	63(42.5%)	4(2.5%)
I know where to find useful health resources on the internet	3(1.9%)	19(11.9%)	54(33.8%)	79(49.4%)	5(3.1%)
I know how to find useful health resources on the internet	3(1.9%)	26(16.3%)	33(20.6%)	88(55%)	10(6.3%)
I know how to use the Internet to answer my health questions	3(1.9%)	13(8.1%)	33(20.6%)	101(63.1%)	10(6.3%)
I know how to use the health information I find on the internet to help myself	3(1.9%)	9(5.6%)	29(18.1%)	104(65%)	15(9.4%)
I have the skills to evaluate the health resources I find on the Internet.	4(2.5%)	16(10%)	53(33.1%)	72(45%)	15(9.4%)
I can tell the difference between high- quality and low-quality online health resources	9(5.6%)	21(13.1%)	51(31.9%)	69(43.1%)	10(6.3%)
I trust Internet information to make health decisions	4(2.5%)	38(23.08%)	55(34.4%)	54(33.8%)	9(5.6%)

Discussion

This study aimed at evaluating E-health literacy in students of Paramedicine and health and nutrition faculties of Lorestan University of Medical Sciences. According to the findings of this study, the average total score of E-health literacy of the participants was at a high level and the level of health literacy was high in most students (56.2%). As Ghazi Mirsaeed and Ghaemizadeh examined, the E-health literacy level of graduate students at Tehran University of Medical Sciences indicated a high level of E-health literacy in these students (10), which is consistent with the results of the present study. In addition, Park and Lee in a study of nursing students in South Korea, found that more than half of the students had high E-health literacy (12). On the other hand, in the study of Afshari et al., The health literacy of adults in Tuyserkan city, reported it at an undesirable level. Participants in the study were mostly non-students with undergraduate education (15), and Dashti et al. reported a low level of health among students at Mashhad University of Medical Sciences (11), which was not in line with the result of the present study in terms of the level of health literacy of the study participants. In explaining this finding, it can be pointed out that it is expected that the students will have a higher level of health literacy due to its university education and the scientific environment in which it is located. However, according to the findings of the present study, there was no significant relationship between academic characteristics (field of study, faculty, degree) and E-health literacy score. These results were not inconsistent with the findings of Rasouli et al., in which they

examined the e-health literacy of patients referred to a military hospital in Tehran. As Rasouli et al. showed, the two groups with master's and doctoral degrees had higher E-health literacy scores than the others, and the sub-diploma level had the lowest average E-health literacy level (16).

Moreover, in the study of Ghazi Mir Saeed and Ghaemizadeh, there was a significant difference between the degree and health literacy of students and PhD students had a higher level of health literacy (10). The reason for the lack of a significant relationship between E-health literacy level and academic level in the present study can be the high ratio of number of associate and bachelor students compared to master's degree students and also the lack of doctoral students in the studied facultys as most of e-learning skills are improved in graduate students.

In this study, there was a significant difference between E-health literacy of 2016 and 2019 entry students, so that the level of health literacy of 2019 students was higher. In this regard, the relationship between age and health literacy level has been reported in previous studies (16, 17). According to Xesfingi and Vozikis study, the level of E-health literacy decreases with age. Holt et al. in their study on the number of outpatients, found that the level of E-health literacy was inversely related to age (18). However, a number of studies did not report a significant relationship between age and E-health literacy level (12, 19).

Regarding this finding, it can be noted that students who have entered the university in recent years and are often younger than their previous admissions, because they are younger, uses information technology more to search and earn health information. In the present study, there was a significant difference between E-health literacy scores of people who have access to the Internet outside of faculty, people who do not have access to the Internet outside of faculty, and students who had access to the Internet outside of faculty had higher E-health literacy. In this regard, Estacio et al. in their study examined some factors related to health literacy and concluded that there was a significant relationship between Internet access and health literacy level (20).

According to the results of the present study, the use of the Internet by students to obtain information about the disease and treatment was far greater than receiving health advice. Levy et al, in their study, found a significant reduction in Internet use to access health and medical information as a result of low health literacy in adults (21). Therefore, the high percentage of students using the Internet to access disease and treatment information can be explained by the optimal level of health literacy in them. In addition, Tubaishat et al., who reviewed E-health literacy among nursing students, concluded that most students did not have sufficient confidence in the accuracy and quality of health information available on the Internet and were unable to assess it (19). Therefore, the reason for not using the Internet in the field of health to receive advice from about half of the participants in the present study can be stated as the difficulty of assessing the accuracy of this information and the low level of student confidence in them.

limitations

Students from different disciplines in the study population have passed a number of different units related to information technology, and this may have affected the results of the study.

Conclusion

According to the present study, despite the fact that the participants had a good level of health literacy, there was a significant difference between the level of health literacy of people who have

access to the Internet outside of faculty and those who have not access to the Internet outside of faculty. The dormitory was also the most popular place to use the Internet. Therefore, planning for more students 'access to the Internet outside of faculty, especially in student dormitories, can help improve students' health literacy levels due to more time and ease of use of the Internet. Furthermore, given that a number of students (38.8%) answered the question, "I know how to find useful health resources on the Internet," as "I strongly disagree," "I disagree," and "I have no opinion", holding workshops and seminars on how to search for e-health information, as well as introducing reputable sources and databases, can be effective in raising students' health literacy levels. In addition, providing reliable health information sources by physicians and health professionals can be an important step in building trust with this information among Internet users.

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