

## Investigate the Relationship Between Health Literacy and Health Promoting Behavior in Students

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### ABSTRACT

**Background and Objective:** Health literacy and health promoting behaviors are among the most important characters of health and their utilization can increase health behaviors, improve access to health care and they are essential for preserve and control the health.

Hence, this study was done to determine the relationship between health literacy and health promoting behaviors among students of Hamadan University of Medical Sciences.

**Materials and Methods:** This study was done by descriptive-analytic method, on 382 students of Hamadan University of Medical Sciences using multi-stage stratified random sampling. Data were collected by use of iraniana dult Health literacy questionnaire (HELIA) and Health Promoting Behaviors (HPLP-II).

**Results:** The total mean score of students' health literacy was 126.13 (19.28). 67% (n = 260) of them, had excellent and desirable health literacy and total score of health promoting behaviors and the total score of health promoting behaviors was evaluated undesirable, with 51.1% of achievable score. Also according to the findings, there was a positive and significant correlation between health promoting behaviors and dimensions of health literacy included: accessibility (r = 0.404), reading (r = 0.324), perception and understanding (r = 0.354), evaluation (r = 0.410), decision making and use of health information (r = 0.552) (P <0.01). Also, there was a positive and significant correlation between health promoting behaviors and all dimensions of health literacy (P <0.01).

**Conclusion:** According to the results of the present study, students' health literacy behaviors increased with increasing health literacy. Therefore, the use of design and performance of educational interventions is suggested to empower students in the field of health literacy.

**Paper Type:** Research Article

**Keywords:** Health Literacy, Health Promoting Behaviors, Students, Hamadan.

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## Introduction

Health literacy is an important outcome of health education (1). Health literacy, includes the ability to understand the instruction of prescription drugs, medical educational brochures, consent forms, the ability to utilization from the complex medical system, the ability to read, hear and analyze, decision making and ability to apply these skills in health situations, especially diseases, that does not necessarily refer to years of education or ability to read (2).

Therefore, the World Health Organization has recently reported health literacy as one of the most important determinants of health (3). Although the rate of health literacy's influence on health is still unclear, but several reasons indicate that many of the undesirable health-related outcomes are insufficient for the effect of health literacy and the health literacy's capacity of individuals is adjusted by education (4, 5). As a more comprehensive concept, health literacy is an important part of health promotion (6); the concept of health literacy was first used to scientific papers of health education field in 1974, Nutbeam then mentioned to this concept in a health-promotion glossary. When people cannot use the health information and services they need, their health literacy is limited and this limitation has a direct and indirect effect on the individual, social and cultural development of individuals (7).

Some factors including drug advances to produce new drugs, increase of non-contagious diseases, move toward customer-service and patient-centered, deployment of health information in the mass media, especially the Internet, have increased the demand for patient participation in decision making and management of disease, as well as the importance of health literacy, In the last two decades (8).

According to the results of studies, patients

play a more important role than health care workers in controlling their health; hence, patients should have the necessary and sufficient involvement in their health care decisions, as an informed person (9). According to a systematic review study in United States, insufficient rate of health literacy was 26% and minimum health literacy was 20% (10).

In the study by Mehdizadeh et al, the health literacy of medical students of Torbat-e Heydarieh was reported 11.9% and it was excellent (11). In the research of Mohammadi-Farah et al, on health literacy of students of Hamadan; 31.6% of students had inadequate health literacy (12). Recognition the factors that influence students' adaptability, causes that health planners and health executives have a better performance to improve the health promotion programs and optimal use of services (12). The present study was done to determine the relationship between health literacy level and health promoting behaviors among medical students of Hamadan in 1397. The present study was done to determine the relationship between health literacy level and health promoting behaviors among the students of Hamadan University of Medical Sciences.

## Methods

The present study, considered a cross-sectional observational study based on the sample size calculation formula for estimate the ratio of optimal health literacy to 50.5% and test power of 0.05 in past studies This research was performed among 382 students of Hamadan University of Medical Sciences (13).

It should be noted that other similar internal studies (12, 14) have used the data collection tools of this study, which included three parts: first part, demographic information such as age,

gender, marital status, economic and educational status, and college of study; second part, the health literacy questionnaire and the third part the Health Promoting Behaviors Questionnaire (15, 16). The sampling method in this study was multi-stage classification; therefore, number of students in each college was obtained by proportional assignment of students to the colleges (ie, the colleges with the largest number of students, the largest number of students assigned) after coordinating with university officials and the research units were rationed and then, the samples were randomly collected. Then, after coordinating with administrators of university and colleges and obtaining their consent, were referred to the students, if they wanted to interview, aware written consent was taken from them, they were assured that the information keeps confidential and then were proceeded to collect the information.

The method of data collection was self-reporting. Inclusion criteria for this study were minimum age of 18 years, studying in Hamadan University of Medical Sciences, and tendency to participate in the study (written consent, interview, questionnaire) and the exclusion criteria were lack of hearing and vision health, mental and cognitive disorder, and disinclination to cooperate.

(HELIA) questionnaire of Health Literacy Iranian Adult: This standard questionnaire has 33 main items including access with 6 questions, that has a 5 point Likert scale always (5 points), most times (4 points), sometimes (3 points), Rarely (2 points) and never (1 point), the score ranges of this item is from 6 to 30 points, reading skill item with 4 question, which has a 5 point Likert scale, is quite easy (Score 5), is easy (Score 4), is difficult (Score 3), is quite difficult (Score 2) and is not easy, not difficult (Score 1) The score range of this item is between 4 - 20 points. The Understanding item has 7 questions and

a 5-point Likert scale always (5 score), most time (4 score), sometimes (3 score), rarely (2) and never (1 score) the score ranges is from 7 to 35 points. The Assessment item with 4 questions, which has a 5-point Likert scale always (5 score), most time (4 score), sometimes (3 score), rarely (2) and never (1 score), the score ranges is from 4 to 20 points. The decision making and information applying item has 12 questions and a 5-step Likert spectrum always (5 score), most time (4 score), sometimes (3 score), rarely (2) and never (1 score), the score ranges is 12 - 60 points. finally, a score from 33 to 165 will be obtained for each individual, that a higher score indicates desired health literacy and a lower score indicates insufficient health literacy. For this purpose, the raw score of each individual in the subscales is obtained from the sum of scores, then a specific formula is used to convert this score to a range from 0 to 100, that the formula includes the following: The difference of the raw score obtained from the minimum possible score, divided by the maximum possible difference of the minimum score. Scores of subscales are accumulated based on a scale from 0 to 100 and divided by the number of subscales (5 dimensions) to obtain the total score. Then the health literacy level of individuals was rated, as so as 0 - 50 health literacy was inadequate health literacy, 50/1 - 66 was non-enough health literacy, 66/1 - 84 was proper health literacy and 84/1 - 100 was excellent health literacy. Montazeri et al, have also designed and validated this questionnaire, that it has the desired construct validity based on the confirmatoral factorial analysis results (REMSA = 0.07, CFI = 0.97,  $\chi^2 / df$  3.2, NFI = 0.95, GFI = 0.81 and AGFI = 0.82) and acceptable stability ( $\alpha = 0.78- 0.90$ ) (16).

Health Promotion Life Style Questionnaire (HPLP-II): Walker presented this questionnaire

and prepared based on a health promotion model and Indicates that people how much perform health promoting behaviors. It actually provides a multidimensional evaluation of health-promoting behaviors; so that it measures the repetition of using health-promoting behaviors in the six dimensions of interpersonal relationships (for example: by talking to others solves my problems), health responsible (for example, taking part in personal health care educating programs), nutritional behavior (for example, eating breakfast), physical activity (for example: I do tensile exercises 3 times a week, at least), stress management (for example: I use specific methods to control my stress), The questionnaire included 49 questions, in which is measured 6 dimensions' self-efficacy (10 questions), health responsibility (12 questions), interpersonal relationships (8 questions), stress management (5 questions), exercise and physical activity (7 questions), Nutrition (7 questions). This questionnaire is scored on a 4-point Likert scale never (1), sometimes (2), often (3), always (4). The total of the questions scores related to each dimension is summed up to obtain the score of that dimension. The sum of the scores of all questions will be summed up, to obtain the overall score of the questionnaire. Scores range is from 49 to 196 (14, 16).

The total score range of health promoting behaviors is between 52- 208 and also a separate score is able to calculate for each dimension. The lower score, means the low health promoting behavior and increasing in score, these behaviors get more desirable. In other words, as the score increases, the persons perform behaviors to preserve and improve their health. The validity and reliability of this questionnaire were measured and confirmed by Hosseini et al. The amount of Cronbach's alpha coefficient for the whole instrument was 95% and for the six subscales ranged from 0.70 to 0.81 (15, 17). Finally, the data

were entered into SPSS statistical software version 21 and descriptive statistics tests, independent t-tests, one-way ANOVA and Pearson correlation were used for analysis them. Significance level was set at 0.05.

## Results

According to the findings, the age range of the research's participants was from 18 to 34 years with a average of  $21.91 \pm 2.86$  years and 59.9% were in the age group of 20-25 years, 56.8% were female, 55% were undergraduate and 27.7% were medical students and 41.4% were in well economic condition.

There is also a significant relationship between health literacy and variables of age ( $P < 0.001$ ), educational level ( $P < 0.001$ ) and college of education ( $P < 0.004$ ). In the other words, older students, master's and doctoral students, and pharmacy, nursing and midwifery students, have more desirable health literacy. Also, according to the findings, there is a significant relationship between health promoting behaviors and variables of age ( $P < 0.001$ ), gender ( $P = 0.028$ ), marital status ( $P = 0.010$ ) and educational level ( $P < 0.001$ ). (Table 1).

Based on Pearson correlation coefficient, health promoting behaviors had positive and significant correlation with total health literacy and all aspects of health literacy ( $P < 0.01$ ). In other words, increasing in students' health literacy, also enhance their health-promoting behaviors (Table 2).

Findings showed that 47.1% of participants in the study had sufficient health literacy. 8.1% of the study's participants had also insufficient health literacy (Table 3) and total score of health literacy was also evaluated with 71.6% of the score achievable at a sufficient level based on the health literacy rating of the instrument used (Table 4).

**Table 1. Relationship Between Health Literacy and Health Promoting Behaviors with Demographic Variables of Study Participants**

Variables		Health Literacy		p	Health Promoting Behaviors		p
		Mean	SD		Mean	SD	
Age Categories	20<	123.99	17.09	F=12.710 P<*0.001	122.05	18.45	F=19.838 P<0.001
	21-25	125.17	19.39		122.56	19.41	
	25>	142.68	19.80		145.93	22.64	
Gender	Male	126.59	22.28	t=0406	126.79	21.36	t=2.209
	Female	125.78	16.68	0.696= P	122.12	19.26	**P=0.028
Marital Status	Single	125.46	19.22	1.815- t= 0.070= P	123.17	19.71	2.582- t= *0.010= P
	Married	130.89	19.15		131.28	23.9	
economic status	Good	128.19	20.22	F=1.456 0.226= P	125.18	21.74	F=2.354 0.072= P
	Medium	123.90	18.74		93/124	89/18	
	Poor	126.89	17.38		125.26	18.17	
	Very Poor	123.30	19.61		116.15	19.78	
Education level	BSc.	123.37	19.14	F=15.596 P<*0.001	120.94	19.72	F=17.553 P<*0.001
	Professional Doctorate	127.64	17.90		126.11	17.92	
	MSc. & above	152.15	17.28		152.62	31.16	
School	Dentistry	126.88	21.59	F=3.257 *P=0.004	125.70	18.65	F=1.442 0.198= P
	Medical	125.88	15.87		124.42	17.17	
	Nursing and Midwifery	130.19	16.60		123.79	19.64	
	Pharmacology	136.67	18.14		128.96	20.96	
	Paramedical	123.82	18.37		121.90	20.32	
	Health	122.36	23.44		124.86	24.36	
	Rehabilitation	104.33	7.57		95.67	4.93	

\* ANOVA TEST \*\* INDEPENDENT T-TEST

**Table 2. Correlation between health promoting behaviors and different aspects of health literacy among students participating in the study**

Variables	Health Promoting Behaviors	General Health Literacy	Access	Reading skill	Understanding	Assessment	Interpretation
Health Promoting Behaviors	1						
General Health Literacy	**0.540	1					
Access	**0.404	**0.754	1				
Reading skill	**0.324	**0.729	**0.572	1			
Understanding	**0.354	**0.809	**0.602	**0.623	1		
Assessment	**0.410	**0.744	**0.504	**0.463	**0.605	1	
Interpretation	**0.528	**0.848	**0.485	**0.447	**0.491	**0.535	1

\*\* P&lt;0.01

**Table 3. Frequency distribution of general health literacy status among students participating in the study**

Percentage	Frequency	Health literacy levels	Frequency of health literacy
8.2	31	Insufficient	0-50
23.8	91	Not Enough	50.01-66
47.1	180	Enough	84-66.01
20.9	80	Excellent	100- 84.01

**Table 4. Mean, standard deviation and mean percentage of maximum score obtainable for different dimensions of health literacy among students participating in the study**

Dimensions of health literacy	Mean	SD	Range of obtainable score	Percentage of Maximum obtainable Score
Access	23.55	4.09	6-30	73.1
Reading skill	15.45	3.27	4-20	72.1
Understanding	28.94	4.87	7-35	78.4
Assessment	15..11	2.98	4-20	69.4
Interpretation	43.09	2.09	12-60	64.8
General Health Literacy	126.13	19.28	33-165	71.6

**Table 5. Mean, standard deviation and mean percentage of maximum score obtainable for different dimensions of health promoting behaviors among students participating in the study**

Dimensions	Mean	SD	Range of obtainable score	Percentage of Maximum obtainable Score
self-efficacy	27.70	6.07	10-40	59
Health Responsibility	29.32	6.63	12-48	48.1
Interpersonal relationships	22.19	4.48	8-32	59.1
stress management	12.35	3.03	5-20	49
physical activity	15.68	5.33	7-28	41.3
Nutritional Behaviors	16.92	4.02	7-28	47.2
Total score of health promoting behaviors	124.17	20.30	49-196	51.1

Interpretation dimension of health literacy had the least amount and worst status among the other dimensions, with 64.8% of the average of the maximum score obtainable. Based on the results of (Table 5), the physical activity

dimension of health promoting behaviors had the lowest amount and the worst situation among the other dimensions with 41.3% of the average of the maximum achievable score. Interpersonal relations dimension also had the

highest score among the other dimensions with 59.1% of the average of the maximum achievable score. Overall, the status of the dimensions of health responsibility, stress management, physical activity and nutritional behaviors were evaluated at the undesirable level and the dimensions of self-efficiency and interpersonal relationships were evaluated at the relatively desirable level.

The total score of health promoting behaviors was also rated undesirable by 51.1% of achievable score, based on the total score range of health promoting behaviors which considered between 20-52, the lower score means the low health promoting behaviors, and the higher score, means more desirable health promoting behaviors. In other words, increasing in the score, causes people perform behaviors to preserve and improve their health (17).

### Discussion

This study was done to determine the relationship between health literacy status and health promoting behavior among 382 Medical Sciences students of Hamadan University.

According to the findings, 47% of students had a proper and excellent health literacy. Similarly, in the study of Mohammadi-Farah et al, 68.4% of Hamadan medical students had sufficient and excellent health literacy (12). Also, Panahi et al, in their study showed that 62.3% of dormitory students of Shahid Beheshti University of Medical Sciences had adequate and excellent health literacy (18), other related studies, and with common field in the medical system, have also reported similar findings to the present study (12, 19, 20) that may be due to courses and studies related to health and disease, therefore, the students of these universities are expected to have proper health literacy. In the current study, health literacy increased by educational level increasing. Similarly, based on studies of

Orloo et al., a systematic review in North America indicated that increasing levels of education had an effect on increasing health literacy (10).

This finding is also in line with the study by Sharif Moghaddam et al, In terms of the relationship between health literacy and increased years of education in students (21). Increasing educating years and more studying in field of health, are probably factors that increase health literacy among college higher education students. Students of these universities are therefore expected to have suitable health literacy (7). Therefore, the results of some studies have reported low health literacy because of differences in the target groups of the study, for example, most of these studies were done on ordinary people in the community, not just educated people in the medical field, these studies also indicate the low health literacy is due to the low level of education (24-22).

there was a statistically significant relationship between health literacy and age, in the current study, which was in line with Sharif Moghaddam's study and probably related to increasing the education years and further studying on health field (21). Various studies have also noted the relationship between age and different levels of health literacy (28-25).

Other findings of the present study showed that the status of dimensions of health responsibility, stress management, physical activity and nutritional behaviors and health promoting behaviors were rated at undesirable level and self-efficacy and interpersonal relationships were evaluated at relatively desirable level. Overall, the total score of health promoting behaviors was rated at undesirable level, with 51.1% of the achievable score. In this line, the Study's results of the Nielsaz et al, showed that more than half of the students of Universities in Dezful had less physical and emotional performance and had also

undesired health promoting behaviors (25). Also in the study of Bagheri et al., The status of health promoting behaviors of students of Hamadan medical college with 42.7% of the mean score of maximum achievable score was reported in undesirable status; Which is in line with the results of the current study (26) and Probably is due to hard university curriculum, lack of regular physical activity, inadequate nutrition habits, lack of effective interpersonal skills training, and stress control training in students of this college.

The results of Cho-Hee research on health promotion behaviors in Korean and Chinese students showed that the health promotion behaviors status of Korean students was desired, that it was in contrast with the results of current study (27) and its possible causes may be unhealthy nutrition habits, inadequate physical activity, cultural differences, and distinct participants in the study .Therefore, promoting health behaviors should be a basic and special need for students and shape their lifestyles. Hence, it is necessary to emphasize the severity of these behaviors and the possible consequences of not performing them in the educational programs by considering the above issues. The results of the current study, in order to explain the final purpose of research on the relationship between health literacy and health promoting behaviors, indicated that there was a positive and significant correlation between students' health promoting behaviors and all aspects of health literacy; actually, in the present study, the higher health literacy of the studied persons, caused to the better their health promoting behaviors.

There was a significant relation between these findings and the results of Chisolm et al., Arnold et al., Stewart et al., in which there was a low literacy level, a lower level of knowledge and a positive attitude toward smoking and

alcohol using (31- 28) in addition to, there was a significant relationship between health literacy, and preventive behaviors and general health status among 18-65 year people in cities of Baluchistan province (32). Also, in the study by Aghamolayi et al., Health literacy had predicted health promoting behaviors among high school students in Bandar Abbas (33). Other related studies have reported similar results to the findings of the present study (34, 35).

As such, it is concluded that the results of present study are in line with most studies, and health literacy is an important factor in improving health promoting behaviors. actually, health literacy acts as a relation between the thinking mode and intendance and perform specific health promoting behaviors; so that health literacy, such as knowledge and attitude, is a cognitive variable and such variables have a statistically significant relationship with each other and on the other hand, health literacy plays an important role in promoting the responsibility of persons to preserve and improve their attitude toward health promoting behaviors and this effect is sometimes found in the aspect of obtaining and accessing to health and medical information, sometimes in terms of understanding it, sometimes in the dimension of processing and interpreting them, and sometimes in decision making (30). Therefore, it seems that the health educators in addition to notice the people's abilities, should also pay attention to their health literacy regarding health behaviors.

Self-report data collection method was one of the limitations of this study that people may not provide correct and exact information to the research team. one of the other limitations of this study was the lack of some students participate in this research plan. It seems that some factors, such as environmental, familial, and cultural conditions, are related to health

literacy dimensions that we did not consider them in this study. Also, another limitation of this study is descriptive research that it is necessary to conduct a qualitative study to identify the variables and factors that increase the health promoting behaviors in students and promote their health literacy.

### Conclusion

Overall, the level of health literacy was desired in the half of studied participants. However, the status of health promoting behaviors was evaluated as an undesirable level. The results of the current study indicated that by increasing in health literacy of students, their health promoting behaviors also increases. Therefore, it is necessary to design and perform some educational interventions to enhance the health literacy of students. It is also suggested that new educational strategies such as virtual education and phone-based education be used to enhance students' health literacy in order to improve their health-promoting behaviors.

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