International Journal of Epidemiologic Research
doi:10.15171/ijer.2019.05 2019 Winter;6(1):24-29 http://ijer.skums.ac.ir

Original Article

Adult Functional Health Literacy and its Related Factors: A Cross-Sectional Study

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Abstract

Background and aims: Health literacy (HL) can affect individual health, health communication and error in taking medicine. The aim of this study was to determine the level of HL and associated factors among Iranian adults.

Methods: In this cross-sectional study, 240 participants over 18 years of age referring to health centers in Hamadan, west of Iran in 2015 were selected by multistage random sampling. HL was assessed by the Test of Functional Health Literacy in Adults (TOFHLA). The questionnaire was completed by a trained interviewer. The independent variables were structural and intermediate social factors based on the Commission on Social Determinants of Health (CSDH). Data were analyzed by using IBM SPSS version 22.

Results: Average age of the participants was 30.88 ±7.38 years and 75.4% of the them were female. The total score of HL was 64.58 ±16.71 (range: 23.82-98.98). Overall, 31.7% (n=76) of the participants had adequate HL level, 32.5% (n=78) had borderline HL level and 35.8% (n=86) had inadequate HL level. Additionally, participants with higher educational levels had higher HL scores than those with lower educational levels ($P<0.001$). HL score was significantly higher in males than in females ($P=0.017$).

Conclusion: HL level seems to be inadequate among Iranian adults in the west of Iran. Moreover, enhancing social determinants such as educational level seems to increase HL. The results highlighted the necessity for change and improvement in adults' HL.

Keywords: Adults, Health literacy, Health promotion, Iran, Social determinant

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Received: 23 May 2018
Accepted: 5 January 2019
ePublished: 19 January 2019

Introduction

Health literacy (HL) is the ability to access, understand, judge and use health information in order to make decisions in health situations.[1] HL is a significant predictor of healthy behaviors and self-care actions. Besides that, poor HL is associated with poor health outcomes.[2,3] Moreover, inadequate HL is associated with higher mortality rates, improper care, and increased health care costs.[4] A large proportion of medication errors occur due to insufficient individual health literacy. A patient's poor understanding of health material complexity and medication labeling is one of the causes of medication errors.[5] Additionally, HL and concordance of language influence self-administering medication.[6] In addition, low HL is associated with ineffective communication with the clinicians and staffs. Individuals ask fewer questions from clinicians because of shame and fear, which can influence health care.[7]

Functional HL is growing in importance because of the increased gap between the social and average cognitive skills of adult health-seekers. Further, functional HL is important because it places fewer burdens on patients and their families for seeking out health services. HL is associated with lifelong learning, including formal and self-education.[8] In health promotion approach, HL is considered an asset which can increase capacity for making decisions and taking actions in health fields.[9]

The European HL survey showed 12% of Europeans had insufficient HL and 47% of them had limited HL.[10] Previous studies in Iran showed that participants had insufficient or limited (44%-79.6%) HL.[2,3,11]

Further, the Commission on Social Determinants of Health (CSDH) framework is useful to address effective factors on health issues (Figure 1). It shows political, social, and economic elements as a set of socioeconomic situations, according to which people are stratified based on occupation, education, income, gender, ethnicity, etc. These structural factors shape intermediate determinants.[12] Socioeconomic factors such as a low education level, low social status, and migrant background have been reported to be associated with limited HL.[10,11,13]

Since there is little knowledge about HL and related factors in Iran, and according to evidence the prevalence of limited HL is varied and seems to be related to geographical concentration, and to explain these gaps, this study was conducted to investigate HL and its related factors in the population of Hamadan, west of Iran. There has yet been no study on HL in Hamadan and the current study is the first one to investigate this issue. Besides that, this study is first to examine the source of information as lifelong learning and language consideration based on the CSDH model to design effective interventions in the future to be used by policymakers in Iran.

Methods

Study Setting and Participants

This cross-sectional, descriptive-analytical study was carried out on people over 18 years of age who referred to Hamadan health centers from May to September 2015. Multistage cluster random sampling was used to select samples. To this end, 15 out of 38 health centers in Hamadan were randomly selected as clusters, and then 240 participants were randomly selected according to the population covered by each health center. A trained interviewer completed questionnaires by interviewing participants. Each interview lasted about 40 minutes.

Inclusion criteria were the age of at least 18 years, no perception or hearing problem, and volunteering to participate in the study. Exclusion criterion was lack of filling out the questionnaire completely.

Measures

The Persian version of the Test of Functional Health Literacy in Adults' Questionnaire (TFHLAQ) was used for data collection. The tool had already been validated in previous studies in Iran.[14,15] In a pilot study with 30 individuals, the reliability of the questionnaire was obtained 0.86 by Cronbach's alpha coefficient. The TFHLAQ consists of 2 parts: reading comprehension and computing skill. The computing part examines the individual's ability to understand a physician's recommendation of health topics. This part has 10 health recommendations (17 items), appearing on cards, about medicine prescription, when to visit a physician, taking financial assistance and an example of medical test results. The minimum and maximum possible scores of this part are 0 to 50, respectively. Reading comprehension part consists of three topics: information for preparing the upper gastrointestinal radiography, patients' rights in the insurance forms, and hospital consent forms. The minimum and maximum possible scores of this part are 0 to 50, respectively. The total HL score ranges from 0 to 100 that is divided into three levels, including inadequate (less than 60) borderline (60 to 75) and adequate (more than 75). Furthermore, age, gender, marital status, education level, household income (structural determinants), mother tongue, and source of information (intermediary determinants) were investigated based on the CSDH framework. The CSDH model argues that socioeconomic status is one aspect of health social determinants. This conceptual framework investigates how social, economic and political structures

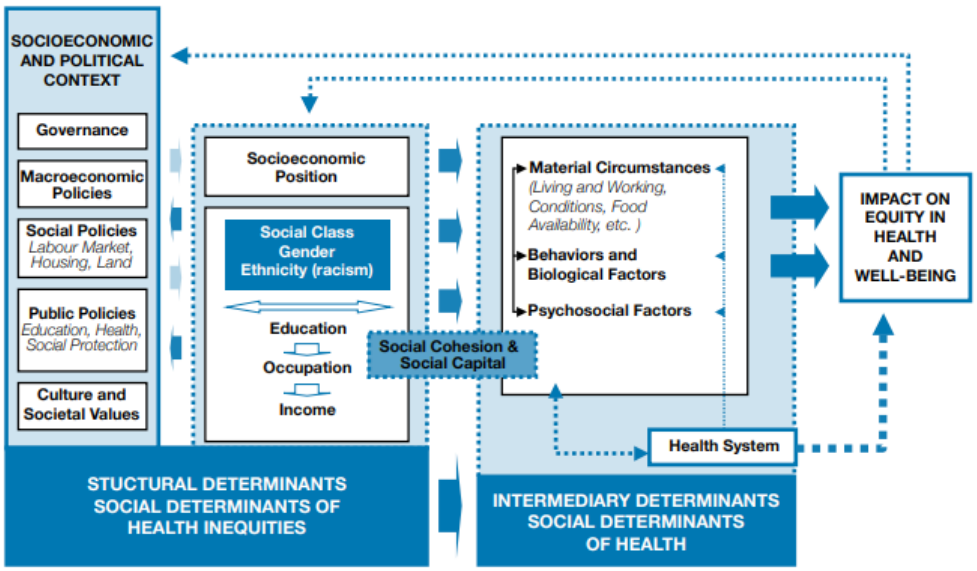

Figure 1. The Commission on Social Determinants of Health Framwork by the WHO.[12]

form socioeconomic situations. Structural determinants include gender, education, occupation, income and ethnicity. Structural determinants influence the intermediary determinants of health, including behaviors and biological and psychosocial factors. The context in this model includes public policies (e.g. health and social support), sociocultural values, laws, and macroeconomic and social policies.[16] Source of information includes physicians, internet, radio and TV, friends, newspapers, brochures, and phone. Hamadan population speak in four languages including Persian, Turkish, Lori, and Kurdish. Informed consent to participate in the study was obtained from the participants before the interview. Interviewer also assured participants that their personal information would be kept confidential.

Statistical Analysis

Descriptive indices were used to describe the participants' characteristics. Multiple regression, analysis of variance (ANOVA), independent *t* test, and chi-square test were used to investigate the relationship between the CSDH variables and HL. All statistical analyses were done using SPSS (IBM Corp. Released 2013, IBM SPSS Statistics for Windows, version 22.0; Armonk, NY: IBM Corp. USA). Significance level was considered <0.05.

Results

In this study, 240 participants aged 18-62 years were interviewed. The mean (SD) age of the participants was 30.88 (7.38) years. Fifty-nine (24.6%) participants were male and 181(75.4%) were female. The total mean (SD) score of HL was 64.59 (16.79), (range: 23.82- 98.98). Academic education level was higher in men than in women (40.7% versus 22.1%). The mean score of HL in men and women was statistically different (*P*=0.017). Furthermore, most of the participants had high school education level and 55 (22.1%) had academic education level. The adequate HL level was higher in women than in men, and people with high education level. The distribution of participants' characteristics based on the CSDH framework is shown in Table 1. Radio and TV, physicians, internet, friends and written materials

Table 1. The Relationship Between the Studied Variables and Health Literacy Level

Independent Variables	No. (%)	Health Literacy Score, Mean (SD)	Health Literacy Category, No. (%)			*P* Value
			Inadequate	Borderline	Adequate	
Gender						0.017[a]
Female	181 (75.4)	63.01 (16.57)	69 (38.1)	64 (35.4)	48 (26.5)	
Male	59 (24.6)	69.08 (16.81)	17 (28.8)	14 (23.7)	28 (47.5)	
Educational level						<0.001[b]
Illiterate	4 (1.7)	37.16 (13.22)	4 (100)	-	-	
Primary school	22 (9.2)	45.43 (14.54)	19 (86.4)	1 (4.5)	2 (9.1)	
Secondary school	51 (21.3)	55.65 (13.35)	27 (52.9)	23 (45.1)	1 (2)	
High school	110 (45.9)	66.21 (13.67)	32 (29.1)	43 (39.1)	35 (31.8)	
Academic	53 (22.1)	77.48 (12.07)	4 (7.5)	11 (20.8)	38 (71.7)	
Occupation						<0.001[b]
Housewife	161 (67.1)	61.88 (16.49)	65 (40.4)	58 (36)	38 (23.6)	
Retired	2 (0.8)	71.78 (9.1)	-	1 (50)	1 (50)	
Student	9 (3.8)	75.48 (16.99)	2 (22.2)	2 (22.2)	5 (55.6)	
Employee	31 (12.9)	74.68 (14.41)	6 (19.4)	6 (19.4)	19 (61.3)	
Others	37 (15.4)	64.82 (16.49)	13 (35.1)	11 (29.7)	13 (35.1)	
Mother tongue						0.009[b]
Persian	99 (41.3)	67.21 (16.58)	29 (29.3)	33 (33.3)	37 (37.4)	
Turkish	99 (41.3)	64.09 (16.21)	35 (35.4)	35 (35.4)	29 (29.3)	
Lori	14 (5.8)	67.90 (19.96)	4 (28.6)	4 (28.6)	6 (42.9)	
Kurdish	28 (11.7)	55.36 (15.29)	18 (64.3)	6 (21.4)	4 (14.3)	
Source of taking health information						0.002[b]
Physician	Physician	63.94 (17.66)	32 (42.7)	25 (33.3)	18 (24.0)	
Radio & TV	Radio& TV	61.38 (17.81)	35 (40.7)	29 (33.7)	22 (25.6)	
Others	Others	70.32 (14.65)	19 (24.4)	23 (29.5)	36 (46.2)	
Age						0.004[c]
		64.83 (17.17)	32.36 (7.84)	30.01 (7.30)	30.13 (6.77)	
Income						<0.001[c]
		1.06 (0.63)	o.901 (0.51)	1.02 (0.61)	1.28 (0.72)	

HL: health literacy.
[a] t test; [b] ANOVA; [c] correlation; income is reported in million Rials (1 million Rials was almost equal to 238 dollars in April 2018).

were sources of health information for participants. Participants who were gaining information from internet and written materials had higher HL ($P=0.002$). Participants' HL level is presented in Figure 2. Overall, 31.7% of participants had adequate HL, 32.5% had borderline HL, and 35.8% had inadequate HL.

The results of multiple regression analysis (Table 2) indicated that education level significantly predicted HL ($P<0.001$). Further, mother tongue, age, income, and gaining information from radio and TV significantly predicted HL ($P<0.05$). The coefficient of determination (R^2) was estimated at 0.477 when adjusting for age, and monthly income-adjusted coefficient of determination was obtained 0.423.

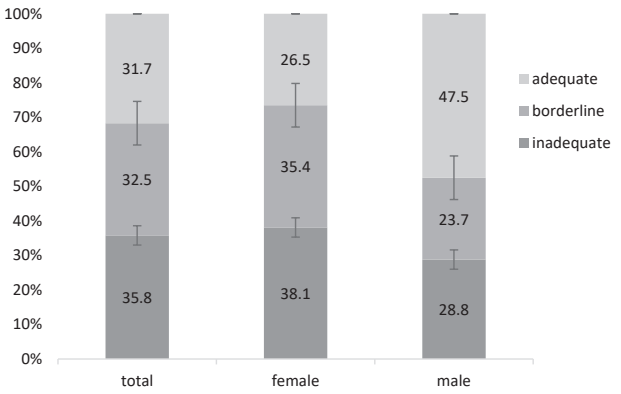

Figure 2. Distribution of Health Literacy Levels of Participants by Gender.

Discussion

The results of this study showed that HL score was low among our participants so that 68.3% of the participants had inadequate and borderline HL levels. The average score of HL was 64.59 (16.79), with a statistically significant difference between the average score of men and women. The adequate HL level was higher in men than in women, and people with high education level. Radio and TV, physicians, internet, friends and written materials were sources of health information for participants. Participants who were gaining information from internet and written materials had higher health literacy. In addition, education level, mother tongue, age, income, and gaining information from radio and TV significantly predicted HL.

Table 2. Health Literacy Predictors in Adults Based on Multiple Regression Analysis

Variables	Coefficient	SE	t	*P* value
Age				
	-0.282	0.133	-2.118	0.035
Sex				
Men	Ref			
Women	-2.540	3.655	-0.695	0.488
Mother tongue				
Kurdish	Ref			
Persian	11.851	3.529	3.358	0.001
Turkish	8.737	3.529	2.476	0.014
Lori	12.786	5.396	2.369	0.019
Source of taking health information				
Others	Ref			
Physician	-2.693	2.291	-1.175	0.241
Radio & TV	-4.585	2.271	-2.019	0.045
Educational level				
Bachelor's degree & higher	Ref			
Up to high school	-23.608	2.856	-8.267	<0.001
Up to associate degree	-10.487	2.624	-3.997	<0.001
Occupation				
Others	Ref			
Housewife	-1.708	3.383	-.505	0.614
Employee	-1.290	3.769	-.342	0.732
Income				
	3.043	1.526	1.994	0.047

SE; Standard error.
Income is reported in million Rials (1 million Rials was almost equal to 238 dollars in April 2018).

Previous studies have reported limited HL among adults, older adults and other subgroups.[14,15,17] A study in Iran showed that 71% of older adults had limited HL that is higher than the finding in our study.[18] A study reported that only 12.3% of the adults in Germany had inadequate level of HL, 31.9% had problematic HL and 55.8% had adequate HL.[19] A study in 5 provinces of Iran revealed that HL in about 71% of the subjects was inadequate or limited and about 28% had adequate HL.[14] These findings are inconsistent with the present study's results that revealed a majority of participants had limited HL. One explanation for higher inadequate HL in older adults can be due to the fact that older adults are more likely to have a comparably lower education level than younger adults. It is notable in all studies that HL has been found as a health issue and needs further attention. Identifying determinants that influence HL will help policymakers and health providers plan for and implement more effective policy and interventions in the health domain by taking HL into consideration.

Predicting HL by education level is in line with previous studies.[20-22] High education level can improve reading and computing skills that affect HL. It seems better to write health materials in a simple and comprehensible manner so that even people with the lowest education level can understand them. Increasing the educational opportunities and improving the literacy skills can influence the HL and decrease inequality in access to health services.[23] However, more studies about HL and decrease in health inequalities are needed.[23]

Furthermore, higher HL score in men compared to women was similar to the finding of Tehrani Banihashemi

et al[14] and contrary to that of Ansari et al in older adults in Iran that showed women had higher HL.[18] A study in the Netherland showed men had slightly lower HL than women and sex was a predictor of HL.[10] Research findings are comparatively less reliable for the association between gender and HL, with some studies indicating no association.[21] The gender differences regarding HL level could be due to education level or attending training sessions about health issues. In the present study, men had higher education and used written resources such as internet, brochures, and newspapers. Reading comprehension and computing skills are the first step to assess HL.[18] Another explanation is that people who used written materials and internet had higher education level. A definite conclusion in this regard needs further studies.

The participants reported that radio, TV, and physicians were the primary sources for them to acquire information. One explanation may be that these means are more widespread than others. It is notable that the communication between physicians and patients during clinical visits should be matched to the patients' health knowledge and perception.[18] Regarding the high incidence of chronic diseases and the necessity of preventing them via health communication, the adequate level of HL is essential for adults to make appropriate health decisions.[24] Low trust in a physician, using a different language or using difficult words could affect communication with people who had lower health literacy.[25] In addition, different languages of clients and health providers or educational materials may interfere with communication.[26] However, using simple words and speaking slowly can improve effective communication between them.[18] The language influences communication. Sometimes, cultural groups have to learn skills to communicate in other languages. Communication in many cases may be incomplete and difficult.[27] The result of this study showed that HL score was higher in people who talk in Persian and Lori than those who talk Kurdish and Turkish. This result can be attributed to the high similarity of the Persian language to Lori. Lectures and media programs broadcast in familiar languages for audiences can be one of the ways to improve HL in the community. Language concordance or using an individual's primary language is essential for health communication.[6]

A strength of this study was face-to-face interview with participants. Interview enabled individuals with poor reading abilities to take part in the study. However, the present study suffers from certain limitations. For example, the numbers of the samples with some mother tongues (e.g., Kurdish and Lori) were small and our results do not permit definite conclusions but give insights for future research. Further, the test of functional health literacy in adults assesses the ability of numeracy skills and reading comprehension but not other components of health literacy such as listening and speaking skills.

Conclusion

HL score of adults in Hamadan, west of Iran is limited. Therefore, effective interventions seem necessary. Besides, this study confirmed that education level could predict HL. It means public policies to enhance literacy skills such as reading and computing will improve HL. HL is associated with the source of gaining health information. Therefore, interactive media, as the most effective sources of health information, enhance HL in adults. Overall, providing comprehensive programs, simple and understandable information and enhancing people's education level could be an actual step to increasing HL in adults.

Ethical Approval

This research project was approved by the Ethics Committee of Vice-Chancellor of Research and Technology of Hamadan University of Medical Sciences (No. p.16.35.9.5455).

Conflict of Interest Disclosures

The authors declare no conflicts of interest.

Acknowledgment

The authors would like to thank the Vice-Chancellor of Research and Technology of Hamadan University of Medical Sciences for funding this study and all participants.

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How to cite the article: Moeini B, Rostami-Moez M, Besharati F, Faradmal J, Bashirian S. Adult functional health literacy and its related factors: a cross-sectional study. Int J Epidemiol Res. 2019;6(1):24-29. doi: 10.15171/ijer.2019.05.