



Evaluation of Health Literacy in the Iranian Population

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Abstract

Objective: This systematic review and meta-analysis was conducted to assess the level of health literacy (HL) in the Iranian population.

Data Sources: Persian and English-language articles were identified through Embase, MEDLINE, CINAHL, PsycINFO, SID, Web of Science, and hand-searching (search dates for articles on health literacy, 1990 to February 2016).

Study Selection: Two reviewers independently selected studies that directly measured health literacy levels.

Data Extraction: Abstracted article information were categorized into evidence tables by one reviewer; information accuracy was checked by a second reviewer. Two reviewers independently evaluated the study quality by using predefined inclusion criteria, and jointly the overall strength of evidence evaluated by the research team.

Results: Twenty-eight relevant good- or fair-quality studies amongst 102 articles were identified, and 44 publications were assessed in full text. The researchers excluded 16 studies: Nine were reports with inadequate results and seven had low quality. Results of meta-analysis showed that better level of HL existed among 66 adults (62.47 to 69.53), 61.62 patients (53.40 to 69.84), 58.88 female (51.68 to 66.07), and 40.98 elderly (17.71 to 64.26).

Conclusions: Health Literacy of the Iranian population was inadequate and borderline. Therefore, the need to increase awareness and intervention to reduce poor HL in the Iranian population is crucial.

Keywords: Health Literacy, Health Literacy Questionnaire, Iranian Population, Systematic Review

1. Context

As a new concept, HL was introduced in 1974 for the first time in scientific publications related to health education. However, it did not receive significant attention for two decades. The term entered the health promotion domain in 1997 by Kick Busch (1). By definition, HL is one's capacity of achievement, interpretation and comprehension of primary healthcare information and services required for proper decision-making (2). It involves a collection of reading, listening, analysis, decision-making, and ability of applying these skills in health-related situations. It does not necessarily correlate with one's education level or general literacy (3-5). Health Literacy has been introduced by the World Health Organization (WHO), as a key determiner of healthcare. It has been recommended globally to create an association to constantly monitor and coordinate strategic activities, especially with the aim of promoting healthcare (6).

Although it is not yet clear how HL affects health-related outcomes, there is plenty of evidence that many un-

desirable health consequences are due to inadequate HL (7). According to the investigations of the U.S. healthcare strategy center, those with low HL have fewer chances of comprehending health staff's oral or written advice. They, therefore, experience a lower health state and pay more for doctors' visits and are hospitalized more often (8, 9). They are less successful in performing self-care acts (10) as well as preventive acts (11) and, therefore, pay higher medical costs (12).

The primary goal of developing HL is facilitating communicative healthcare and HIT strategies to promote health status and achieve equality in health service provision (13).

Since HL is currently part of general health and due to the impact of this issue on social health promotion as well as the lack of related systematic research in the Iranian context, the present researchers intended to conduct a systematic review and meta-analysis to analyze and synthesize the body of research that investigated HL on different population groups in Iran.

2. Methods

2.1. Search Methods

The data were collected from national and international Persian and Latin databases, including MEDLINE, CINAHL, PsycINFO, SID, and Web of Science. A manual search was carried out for journals, organizational reports or different scientific teams. The primary analysis of the body of research included the following key terms searched in Persian and English via the OR and AND operators: HL, Iran, Persian HL Questionnaire, Test of Functional HL in Adults, Questionnaire NVS, HELIA Questionnaire, and Functional HL.

2.2. Eligibility Criteria

These criteria included cross-sectional research, search strategy in the Iranian context, and search strategy of research published in Persian or English between year 1990 to the end of February 2016.

2.3. Data Abstraction

Abstracted article information was categorized to evidence tables by one reviewer; information accuracy was checked by a second reviewer. Two reviewers independently evaluated study quality assessment by using predefined inclusion criteria, and jointly the overall strength of evidence was evaluated by the research team.

2.4. Quality Assessment

The quality of included studies was assessed using the National Institutes of Health Quality Assessment tool for observational cohort and cross sectional studies (<http://www.nhlbi.nih.gov/health-pro/guidelines/indevelop/cardiovascular-risk-reduction/tools/cohort>). Reporting of studies was assessed using an adapted version of the STROBE statement, which is a checklist of items that should be addressed in articles, reporting on three main study designs: cohort, case-control, and cross-sectional. This is included in the online supplementary material (14). The articles were categorized in terms of the significance and relevance to the topic, and then each part of the article, which could be used later on, was determined. The strengths and weaknesses of each article were noted and an overall evaluation was done, accordingly.

2.5. Data Extraction

Articles to be included were described and presented according to certain criteria, including the main author, year of publication, purpose of research, settings, sample size, Strobe checklist score, target group, type of questionnaire, and subjects' HL. Subsequently, the researchers entered the data from the articles in the Excel software, according to the items already mentioned in data extraction section.

2.6. Criteria for Classification of Health Literacy Scoring

The basis for classification of HL was the instruments used in studies. In these instruments (TOFHLA, HELIA and NVS), according to the cut-off points, there were three levels of HL interpretation: inadequate, borderline and adequate, and the interpretation of the results was done on the basis of instrument scoring.

2.7. Risk of Bias in Individual Studies

In order to minimize publication bias, a comprehensive search was carried out in a variety of databases. Moreover, in order to evaluate the heterogeneity, the present researchers analyzed all the articles in terms of participants and results.

2.8. Data Analysis

To evaluate heterogeneity among studies, the Q test ($P < 0.1$) and I-square statistics were used. In presence of heterogeneity, a random effect model was applied to compute pooled effect size (ES). The pooled health literacy was presented as 95% confidence interval (CI). The potential publication bias was assessed using Egger's test ($P < 0.1$ as significantly). All statistical analyses were done with the Stata software, version 14 (Stata Corp LP, College Station, Texas, USA) and $P < 0.05$ was statistically significant.

3. Results

3.1. Results of the Search

Two review authors (AS and SD) screened a total of 102 abstracts for inclusion (Figure 1), and assessed 44 publications in full text. The authors excluded 16 studies: Nine were reports with inadequate results and seven had low quality (see Characteristics of excluded studies, Figure 1).

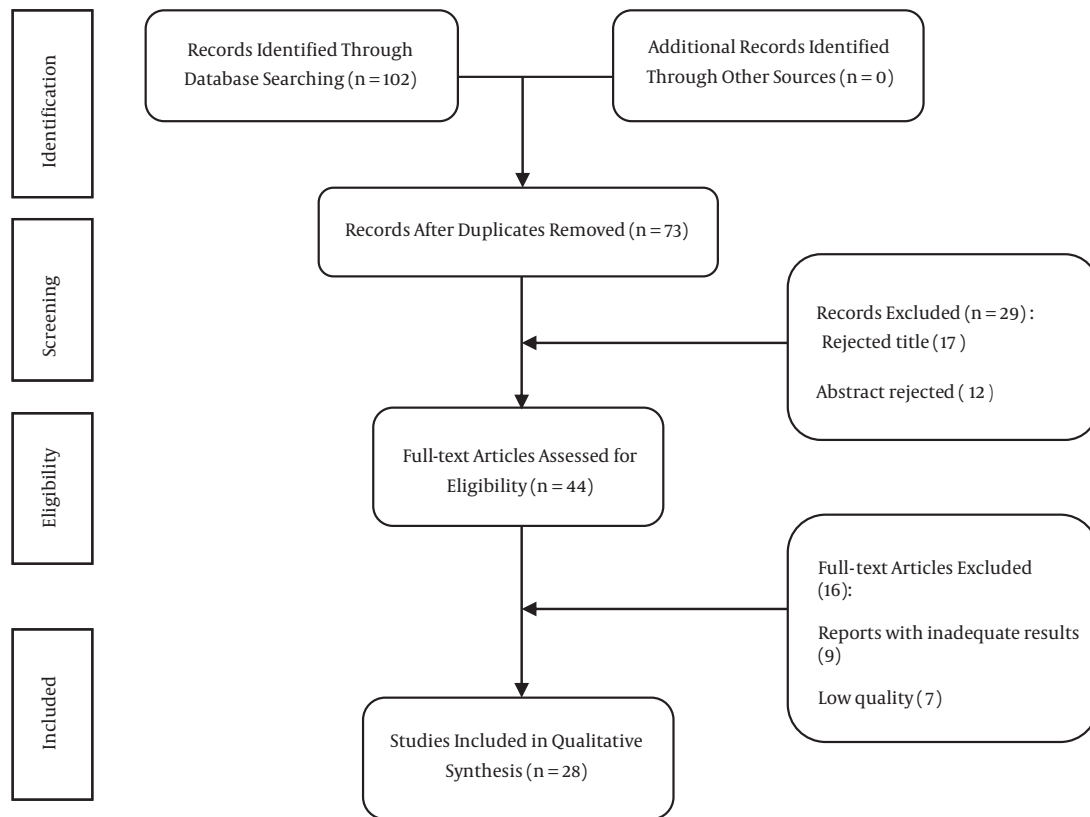


Figure 1. PRISMA flow diagram

3.2. Characteristics of Reviewed Studies

All the articles were considered as cross-sectional. Twenty-two studies used the TOFHLA questionnaire, five HELIA, and one study NVS. The sample size range was from minimum (N = 60) to maximum (N = 20571). Also, seven articles dealt with healthy adults; four addressed the elderly; ten pertained to hospitalized patients; five studied females and two had addressed HL among university students (see in Table 1).

3.3. Data Analysis Based on the Systematic Review

The strategy was to combine data of individual studies, according three levels of HL, as reported in Table 1 (inadequate, borderline, and adequate). All Iranian population-related studies assessed HL by self-administered questionnaires. According to the results, seven studies (N = 24247) reported adult-related HL, four studies (N = 914) assessed elderly-related HL, ten studies (N = 2204) conducted patient-related HL, and women-related HL was measured in five studies (N = 1007) and two studies were conducted on students (N = 868) (Table 2).

3.4. Data Analysis Based on Meta-Analysis Criteria (Mean and SD)

Seventeen studies were analyzed with the criteria for entering the meta-analysis. Estimation of meta-analysis results showed that the mean HL in the Iranian population was 59.96, CI 57.01 to 62.90. The researchers were able to combine data of five studies on adult-related HL (N = 24247) in a meta-analysis. According to the calculations, the mean HL in adults was estimated as 66, CI 62.47 to 69.53. Also the Q-test $P < 0.001$ and I^2 statistic was 99.8 (Table 3; Figures 2 and 3).

The Egger's test (Bias = 16.2, $P = 0.003$) found statistically significant publication bias (Figure 4).

4. Discussion

Results of this systematic and meta-analysis showed that HL in the Iranian population was borderline. Health literacy is a key factor involved in increasing social health-care. The related literature in other populations worldwide also indicates a significantly inadequate level of HL.

Table 1. Characteristics of Studies According to Data Extraction in the Iranian Population

Authors	Sample Size	Target Group	Type of Questionnaire	Report Type	HL Level (Percentage to Total Sample Size)			Score of HL (0 - 100)	
					Inadequate	Average	Adequate	Mean	SD
Javazdeh et al. (2013) (15)	525	Adult	TOFHLA	Self-administered	15.5	38	46.5	69.8	16.2
Tavousi et al. (2015) (16)	20571	Adult	HELIA	Self-administered	12	32.4	55.6	68.32	15.16
Tehrani Banihashemi et al. (2007) (17)	1086	Adult	TOFHLA	Self-administered	56.6	15.3	28.1	42.7	36
Afshari et al. (2014) (18)	285	Adult	HELIA	Self-administered	32.9	60.5	6.6	NR	NR
Haerian et al. (2015) (19)	380	Adult	TOFHLA	Self-administered	15.25	25.75	59	73.33	1.29
Izadirad and Zareban (2015) (20)	400	Adult	HELIA	Self-administered	34	34	32	NR	NR
Nekoei-Moghadam et al. (2012) (21)	1000	Adult	TOFHLA	Self-administered	4.8	53.8	41.4	74.4	9.1
Javazdeh et al. (2012) (6)	354	Elderly	TOFHLA	Self-administered	79.6	11.6	8.8	29.07	30.45
Kooshyar et al. (2013) (22)	300	Elderly	TOFHLA	Self-administered	70	14	16	52.82	13.25
Reisi et al. (2014) (23)	60	Elderly	TOFHLA	Self-administered	80.7	10.9	8.4	NR	NR
Mohseni et al. (2015) (24)	200	Elderly	TOFHLA	Self-administered	52	31	17	NR	NR
Mollakhalili et al. (2014) (25)	384	Patient	TOFHLA	Self-administered	40.1	27	32.9	63.31	18.13
Khosravi and Ahmadzadeh (2016) (26)	250	Patient	TOFHLA	Self-administered	39.2	38	22.8	69.2	14
Malekzadeh et al. (2016) (27)	200	Patient	TOFHLA	Self-administered	49	22	29	NR	NR
Rafiezadeh Gharrehtapeh et al. (2015) (28)	100	Patient	HELIA	Self-administered	21	59	20	86.7	21.9
Tol et al. (2012) (29)	160	Patient	TOFHLA	Self-administered	19.4	46.9	33.7	57.40	15.87
Mohammadi et al. (2015) (30)	407	Patient	TOFHLA	Self-administered	70	11.8	18.2	43	28.7
Moeni et al. (2016) (31)	131	Patient	TOFHLA	Self-administered	73.3	16.4	10.3	48.22	7.73
Kohan et al. (2007) (32)	150	Women	TOFHLA	Self-administered	34	48	18	NR	NR
Peyman and Abdollahi (2016) (33)	120	Women	TOFHLA	Self-administered	30	42.5	27.5	51.4	12.3
Zareban and Izadirad (2016) (34)	247	Women	TOFHLA	Self-administered	33.2	34.4	32.4	NR	NR
Ghanbari et al. (2011) (35)	240	Women	TOFHLA	Self-administered	30	24.6	45.4	66.4	14.8
Peyman et al. (2015) (36)	250	Women	TOFHLA	Self-administered	82.8	6	11.2	58.78	9.55
Miri et al. (2016) (37)	75	Patient	TOFHLA	Self-administered	38.6	46.7	14.7	64.14	7.19
Darvishpour et al. (2016) (38)	257	Patient	TOFHLA	Self-administered	28.4	30	41.6	NR	NR
Qobadi et al. (2015) (39)	240	Patient	TOFHLA	Self-administered	27.65	12.75	59.6	NR	NR
Mahmoudi and Taheri (2015) (40)	368	Students	HELIA	Self-administered	25	38.31	36.69	NR	NR
Ramezankhani et al. (2015) (41)	500	Students	NVS	Self-administered	35.6	43.4	21	NR	NR

Table 2. Subgroup Systematic Review of HL in the Iranian Population

Sub Group	No. of Study	Sample Size	HL Level (Percentage to Total Sample Size)		
			Inadequate	Average	Adequate
Adult	7	24247	24.43	37.1	38.47
Elderly	4	914	70.57	16.87	12.56
Patient	10	2204	40.88	30.28	28.84
Women	5	1007	42	31.1	26.9
Students	2	868	30.3	40.86	28.84
Total	28	29240	41.63	31.24	27.12

In a systematic review of 85 studies in North America, Paasche-Orlow et al. reported 26% inadequate HL and 20% mean HL (42). Wagner et al. reported the HL of English adults as 4.11% (43). In their research on elderly patients with diabetes and hypertension in two American hospitals, Williams et al. estimated HL as inadequate since it was 44% in elderly diabetic patients and 49% in those with hypertension (7). The findings obtained by Ozdemir et al. in

Turkey revealed that more than two-thirds of the subjects (97.1%) had low or average level of HL (44). In the Netherlands, HL was reported by Fransen et al. to be mostly inadequate and average (79%) (45). In Lee's investigation, about 30% of Taiwanese adults showed average or low level of HL (46).

Health Literacy has a direct relationship with community health and has a reverse relationship with medical ex-

Table 3. Subgroup Meta-Analysis of HL in the Iranian Population

Group	No. of Study	Sample Size	Mean (95% CI)	Heterogeneity	
				I ² (%)	Q-Test
Adult	5	23562	66 (62.47 - 69.53)	99.8	< 0.001
Elderly	2	654	40.98 (17.71 - 64.26)	99.4	< 0.001
patient	7	1507	61.62 (53.40 - 69.84)	99.2	< 0.001
Women	3	610	58.88 (51.68 - 66.07)	98.1	< 0.001
Total	17	26333	59.96 (57.01 - 62.90)	99.8	< 0.001

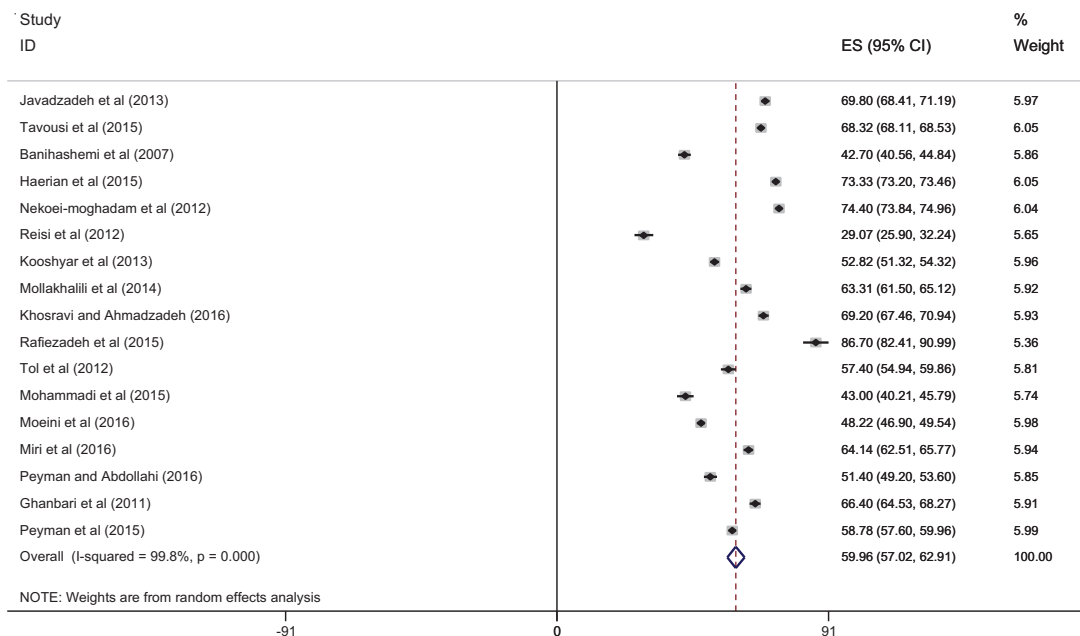


Figure 2. Forest plot of the Mean HL in the Iranian Population

penses. This is why in the recent years, most of developed health systems in the world dedicated much of their activities and sources to public education (47).

According to the present findings, elderly HL was low. Kutner et al. at the national level, in the United States, indicated that only 3% of the elderly had adequate HL (48).

In the study of Wagner et al. in the UK, 30% of the elderly with 60 years of age, had inadequate HL (43). The results of the Bostock and Steptoe study showed that 67.2% of the elderly had high health literacy, and 20.3% and 12.5% had low HL (49).

A variety of research has indicated that the low level of HL in the elderly is accompanied by consequences, including higher mortality rate (50), fewer preventive attempts, such as screening tests (51), showing certain high risk be-

haviors (52), and lower physical and mental health (53). On the other hand, according to previous reports, currently about 6% of the entire Iranian population are above 60 years of age. This rate is predicted to be 26% by 2050 in the Iranian population (54). Therefore, the wide range of inadequate HL of the elderly is a warning to authorities and healthcare policy makers. The need for more attention to HL seems to be essential in health promotion plans.

Considering the importance of old age and increasing elderly population, it has been suggested that special facilities, such as associations related to the needs of the elderly, and training courses with a focus on lifestyle and health literacy should be considered.

The findings related to the female population showed a borderline level of HL. In different studies, the HL of most

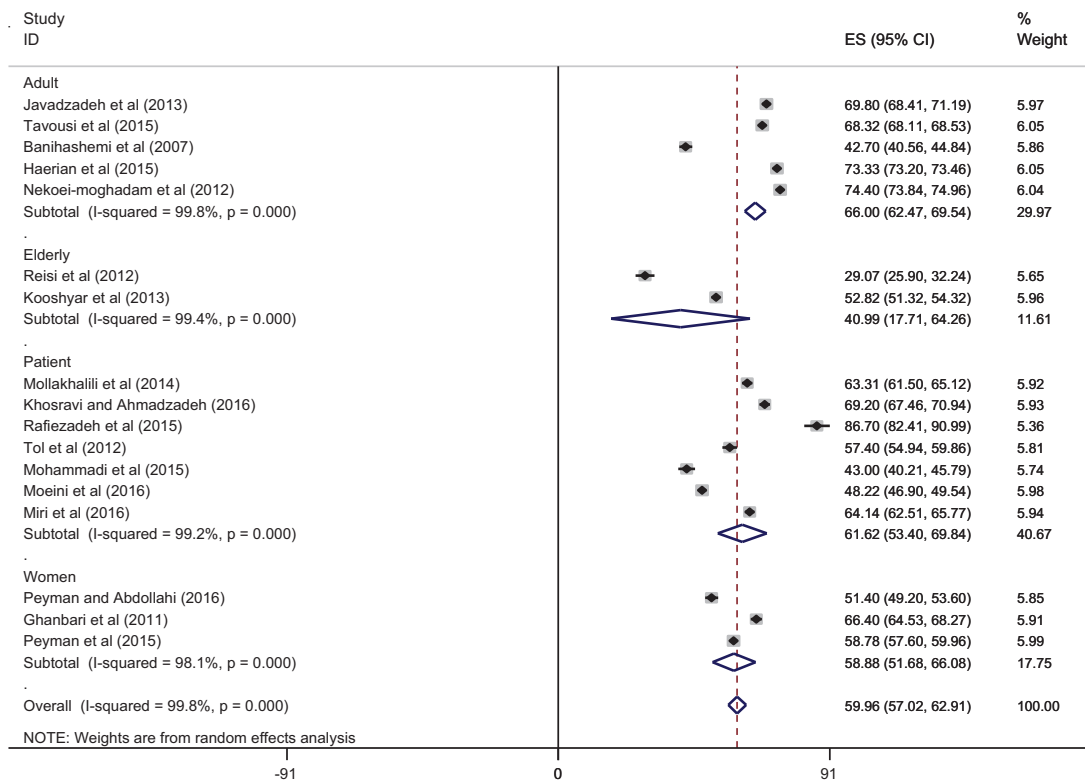


Figure 3. Forest plot of the Mean HL in a subgroup of the Iranian population

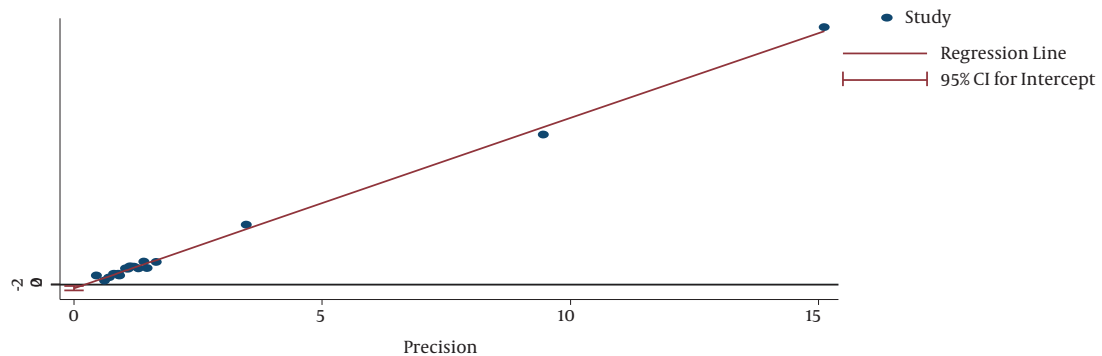


Figure 4. Egger's test funnel plot for publication bias

females was reported as borderline (5, 55). Jovic-Vranes and Bjegovic-Mikanovic in Siberia reported that 44% of females had inadequate and borderline HL (56). Also, Lee et al. found that approximately 29% of females had inadequate and marginal health literacy (57). Furthermore, HL is considered as a key element of female's involvement in health promotion activities and preventive acts for the themselves and their family. It is nearly impossible for a

woman to make the right health-related decision for herself and her family when she is unequipped with proper healthcare knowledge (58).

A systematic review study by Berkman et al. examined the relationship between health literacy and health outcomes (59). Considering the importance of the relationship between HL and use of health outcomes, health care services and costs, it is crucial to consider population

health literacy levels.

Analysis of instruments showed that the most common instrument used in systematic and meta-analyses was TOFHILA. As highlighted by Haun et al. a proper health-care instrument should assess multiple aspects of literacy, including interaction, reading comprehension, numeracy comprehension, information search, performance, decision making, evaluation, responsibility, self-efficiency, and diagnosis (60). However, this instrument only addresses reading comprehension, numeracy comprehension, and evaluation. On the other hand, this instrument was used for all groups (healthy or unhealthy). One reason for the low level of HL in Iranians might be that there is no instrument specifically designed for measuring HL. Therefore, development of HL measurement instruments for specific groups with a focus on three variables, including use of health information, perception of health state, and use of health services seems necessary.

5. Conclusion

The results showed that better HL existed among adults, patients, females and elderly, respectively. This research found that HL of the Iranian population was inadequate and borderline. Therefore, the need to increase awareness and intervention to reduce poor HL in the Iranian population is crucial. Therefore, attention to elderly and females that appear most likely to have low levels of HL is necessary. These strategies will not be achieved without recognition that HL is a serious concern. In fact, to increase the level of HL of the community, the simplification of information and understandable educational materials, communication strategies and assistance from health education professionals for planning, and the design of educational programs will be useful.

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Footnote

Conflict of Interests: There was no conflict of interest to be declared.

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