Health literacy and its associated demographic factors in 18–65-year-old, literate adults in Bardaskan, Iran

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Abstract:

AIMS: Improvement of general health literacy is one of the ways to achieve the desired public health condition. To this end, the first step is to determine the health literacy level and its associated demographic factors in individuals.

SETTINGS AND DESIGN: This study was a cross-sectional, descriptive-analytic survey conducted on 700 adults (age range: 18–65 years) in Bardaskan, Iran. The required samples were selected via random cluster sampling method.

SUBJECTS AND METHODS: The demographic questionnaire was used to collect sociodemographic information. The Health Literacy for Iranian Adults questionnaire was used to determine the level of health literacy in participants.

STATISTICAL ANALYSIS: Data analysis was conducted using SPSS software version 20 through descriptive and inferential statistics. Results were considered statistically significant at $P \leq 0.05$.

RESULTS: A total of 700 participants with a mean (standard deviation) age of 31.25 (9.32) years participated in this study. The primary sources of health information were physicians and health staff (50.9%) followed by the Internet (19.7%). The health literacy level of 18.1% of the participants was inadequate, 27.7% was marginal, 39.4% was adequate, and 14.7% was excellent. The mean overall scores of health literacy and its subscales were within the adequate range (66.1–84.0). The relationships of health literacy level with age, education, marital status, occupational status, and history of disease were statistically significant ($P < 0.001$).

CONCLUSION: It seems necessary to design and implement a variety of educational programs to improve the general health literacy of the citizens of Bardaskan. Educational programs need to focus on groups with higher priority such as elderly people, individuals with lower educational levels, widows/ widowers and divorced/separated individuals, unemployed and retired individuals, homemakers, and individuals with a history of disease.

Keywords:

Adult, health literacy, Iran

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Introduction

The term "health literacy" refers to cognitive skill and is a core issue in health-care systems. The term was first introduced in 1974 in an educational panel about health education.[1] Since then, different definitions have been proposed. According to the World Health Organization (WHO), health literacy, in the same spirit, refers to cognitive and social skills that determine the motivation and capability of individuals to achieve, perceive, and utilize information in a way that leads to the preservation and improvement of their health.[2] By definition,

health literacy is the level at which individuals and groups of people can obtain, interpret, understand, and assess the information needed to make a decision in the public health arena and take action based on the decision in a way that is in favor of the society.[3] It is a set of reading, listening, analyzing, and decision-making skills and the ability to use such skills in health-related situations, which is not necessarily related to educational level.[4]

Health literacy is considered one of the most critical determinant factors for successful improvement of the different aspects of public health.[5] A study in the UK reported that people with higher health literacy and health information are more likely to take care of their health, and this has to do with better health outcomes among those who actively participate in health-care decisions.[6] Researchers believe that health literacy has direct effects on health outcomes, and improving health literacy is an effective strategy to promote and maintain the health status of individuals.[7] Health literacy is a good indicator which shows that to what extent one is capable of deciding and managing his/her health. Studies have confirmed that the level of health literacy is closely related to preventive and health-promoting behaviors.[8,9]

Dealing with complex health systems is not easy, even for those with adequate health literacy; however, one has to deal with far more challenges when he or she has a low level of health literacy. On the other hand, providers of health services are not aware of the extent of health literacy and reading ability of their referrals and suffice to give health-related information, while the patients do not know the meaning of many of the terms and expressions used by health personnel. Therefore, the transfer of information between the providers and recipients of health services is halted.[10] According to WHO recommendations, all countries need to establish an association of all the stakeholders to monitor and coordinate strategic activities toward the improvement of health literacy in different communities.[5]

International studies have shown that low health literacy is prevalent across the populations.[11] Reports from an international study involving 8000 people from eight European countries indicated that 59% of people in Europe suffer inadequate or marginal health literacy.[12] A study in Germany revealed that one out of two citizens lacked adequate health literacy.[13] This figure has been reported to be comparatively higher than that in the UK population.[14] Studies conducted in South Korea and Serbia have shown that 61% and 46% of people suffer low health literacy, respectively.[15,16] Several studies conducted in Iran have also suggested that Iranian people lack adequate health literacy.[4,10,17,18] A national survey showed that about one-half of the people in Iran (44%) had limited health literacy.[19] Naghibi *et al*.'s study in 2017 in ten city neighborhoods of Shahriar, Iran, also revealed that 60% of the participants had an inadequate level of health literacy.[4]

Some factors, such as education and financial status, are known to affect health literacy in individuals;[13] however, there seem to be many demographic factors related to health literacy, which are not well recognized. This highlights the need for investigation of other factors which influence health literacy of individuals through designing and implementing health educational interventions as a way to achieve desired health outcomes. Through this, it is possible to determine groups with higher priority for subsequent educational interventions. To this end, the first step is to measure the health literacy level and its associated demographic factors in individuals. Studies in Iran have mostly looked at health literacy from the clinical viewpoint rather than from a public health perspective.[20,21]

Further, there are relatively a few studies assessing health literacy level and its associated demographic factors among Iranian populations using a well-validated scale.[22] Therefore, the present study is aimed at determining general health literacy level and its associated demographic factors (gender, age, education, marital status, occupational status, and history of disease) in literate adults in the age range of 18–65 years in Bardaskan, Iran. The results, if the association of health literacy and demographic factors is supported, can help governors, health policymakers, and health educators to implement the appropriate interventions to improve the health literacy of the general population and those with higher priorities, in particular.

Subjects and Methods

This study is a cross-sectional, descriptive-analytic survey conducted on 700 literate adults (age range: 18–65 years) in Bardaskan, Iran, in 2016. The inclusion criteria were a resident of Bardaskan, aged 18–65 years, and the ability to read and write. Individuals who met the inclusion criteria were then asked whether they are willing to participate in the study. Vision or hearing impairments, mental disorders, physical or mental disability, and incomplete answering of the questionnaire were considered as exclusion criteria. The single population proportion formula was used to determine the required sample size. Based on the findings from a similar previous study,[23] the desired precision of 2.5% at 95% confidence level, and 10% nonresponse rate, the required sample size was estimated to be 876 individuals. The response rate was 79.9%, and 700 fully completed questionnaires were obtained. Despite the

relatively high rate of incomplete and inadequately filled-out questionnaires, statistic experts were convinced that this did not affect the final results so that only the accuracy of results decreased from 95 to 94.

The required samples were selected via random cluster sampling method. There are two district health centers in Bardaskan city; each of them was considered as a cluster. Then, the population covered by each center was divided into two blocks. Afterward, 200 participants were selected randomly from each of the four blocks (population distribution among the four blocks was the same). To fill out the questionnaires, the researchers accompanied by a health staff visited the participants at their doorsteps. After briefing the objectives of the study and securing the participants' consent, the questionnaires were delivered and filled out as self-report.

The data collection tools included two questionnaires. The demographic questionnaire was used to collect sociodemographic information, including age, gender, marital status, education, occupational status, and history of a disease. The Health Literacy for Iranian Adults (HELIA) questionnaire, developed by Montazeri *et al*.,[22] was used to determine the level of health literacy in participants. The validity of the scale has been confirmed earlier, and the Cronbach's alpha reliability coefficient of the overall scale and five subscales was satisfactory (0.72–0.89).[22] The scale contains 33 items which assess the respondents' health literacy in five domains, namely, access (six items), reading (four items), understanding (seven items), appraisal (four items), and decision (12 items). Scoring is based on a 5-point Likert scale from "always" to "not at all." The obtained scores were calculated both for overall health literacy and subscales' scores. The score of each subscale was calculated from the sum of scores of all items in that subscale. The overall scale score was calculated from the sum of the scores of all subscales. The range of possible scores for each subscale was as follows: access, (6–30), reading (4–20), understanding (7–35), appraisal (4–20), and decision (12–60). The final score was derived through converting the scores of the five subscales of health literacy to a standard score from 0 to 100. According to the scoring guideline, a score from 0 to 50.0 indicates an inadequate level of health literacy, 50.1 to 66.0 represents the marginal level of health literacy, 66.1 to 84.0 represents an adequate level of health literacy, and 84.1 to 100 reflects an excellent level of health literacy.[22]

Statistical analysis

Data analysis was conducted using SPSS software version 20 (SPSS Inc., Chicago, Illinois, USA) through descriptive statistics (mean, standard deviation [SD], frequency, and percentage) as well as inferential statistics (independent *t*-test, Chi-square test, and Kolmogorov–Smirnov test). The results were considered statistically significant at $P \leq 0.05$.

Ethical consideration

In observance of moral concerns, ethical approval was obtained from the Ethics Committee of Sabzevar University of Medical Sciences (IR.Medsab.Rec. 1395.105). In addition, prior arrangements were made by the authorities of the Bardaskan city health network. Further, written consent was obtained from all participants. To ensure confidentiality, all participants were assured that their anonymity would be maintained.

Results

A total of 700 persons with a mean (SD) age of 31.25 years (9.32) and in the age range of 18–65 years participated in this study. Out of them, 61.6% were male and 77.8% were married. Most of the participants (42.8%) had a diploma degree, and a larger proportion of participants (30.0%) were homemakers. Almost all participants (92.2%) reported that they do not have a history of a disease. Physicians and health staff (50.9%), the Internet (19.7%), and radio and television (10.4%) were the respondents' primary sources of health information [Table 1].

Table 1: Demographic characteristics of the participants (*n*=700)

Characteristics	Categories	*n* (%)
Gender	Men	431 (61.6)
	Women	269 (38.4)
Age	18-30	365 (52.1)
	31-45	279 (39.9)
	46-65	56 (8.0)
Education	Primary/middle school	98 (14.0)
	Diploma degree	300 (42.8)
	Undergraduate degree	267 (38.2)
	Masters/PhD degree	35 (5.0)
Marital status	Single	131 (18.7)
	Married	545 (77.8)
	Widow/widower	15 (2.2)
	Divorced/separated	9 (1.3)
Occupational status	Civil servant	145 (20.7)
	Unemployed	31 (4.5)
	Homemaker	210 (30.0)
	Retired	17 (2.5)
	Student	103 (14.78)
	Self-employed	194 (27.7)
History of disease	No	646 (92.3)
	Yes	54 (7.7)
Source of health information	Physicians and health staff	356 (50.9)
	Internet	138 (19.7)
	Radio/television	73 (10.4)
	Newspaper/magazine	9 (1.3)
	Friends and acquaintances	28 (4.0)
	Brochure/leaflet/booklet	11 (1.6)
	Multiple choices	84 (12.0)

A larger proportion of participants (39.4%) obtained a mean (SD) score of 66.38 (16.93) in overall health literacy, which is within the adequate range. Further, a larger proportion of participants obtained an adequate score in the access subscale, an inadequate score in the reading subscale, an excellent score in the understanding subscale, an adequate score in the appraisal subscale, and an adequate score in the decision subscale [Chart 1].

The mean (SD) of scores in the subscales of health literacy was as follows: access, 69.50 (18.98); reading, 59.42 (25.22); understanding, 70.03 (23.49); appraisal, 62.91 (22.15); and decision, 66.38 (16.93). A larger proportion of men (38.7%) and women (40.4%) obtained an adequate score in overall health literacy.

There was no statistically significant difference between genders regarding the level of health literacy ($P = 0.13$). However, a statistically significant difference was found
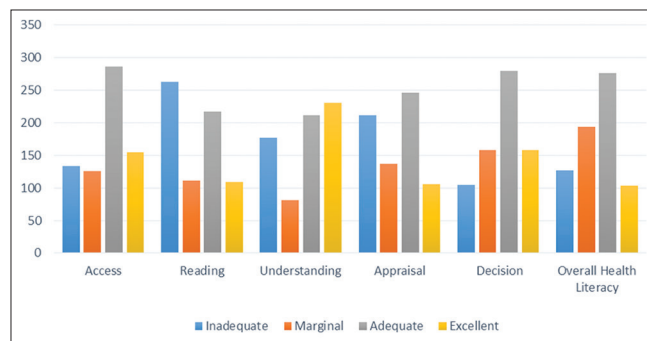

Chart 1: Health literacy level in participants (*n* = 700)

between the three age groups (18-30, 31-45, and 46-65) regarding the level of health literacy ($P < 0.001$). The association of education, employment status, marital status, and the history of a disease with the level of health literacy was statistically significant (all $P < 0.001$). The frequency and percentage of health literacy level according to the demographic variables are listed in Table 2. The mean score of different domains of health literacy according to the sources of health information categorized by gender is listed in Table 3.

Discussion

Low health literacy is a global issue, and due to its role in the decisions made by people in health-related fields, promoting health literacy is one of the main tools in the hands of policymakers to promote the level of health within the societies and improve the quality of health services.[5] This study sought to explore general health literacy and its associated factors in literate residents of Bardaskan city. Based on the findings, the health literacy level was inadequate in 18.1%, marginal in 27.7%, adequate in 39.4%, and excellent in 14.7% of the participants. The mean overall scores of health literacy and its subscales were within the adequate range. Naghibi *e*t *a*l. in 2015 studied the level of health literacy in 299 adults in Shahriar, Iran. They reported that the level of health literacy was at an excellent level in 14.4%, at an adequate level in 25.4%, at a marginal level in 23.7%, and an inadequate level in 36.5% of the study participants.[4] Therefore, the health literacy level of participants in the present study was higher compared

Table 2: Levels of health literacy according to the demographic characteristics (*n*=700)

Level of health literacy		Inadequate, *n* (%)	Marginal, *n* (%)	Adequate, *n* (%)	Excellent, *n* (%)	*P*
Characteristics	**Categories**					
Gender	Men	69 (16.0)	119 (27.6)	174 (40.4)	69 (16.0)	0.13
	Women	59 (21.9)	75 (27.9)	104 (38.7)	31 (11.5)	
Age	18-30	43 (11.8)	118 (32.3)	149 (40.8)	55 (15.1)	0.001
	31-45	56 (20.1)	62 (22.2)	115 (41.2)	46 (16.5)	
	46-65	28 (50.0)	14 (25.0)	12 (21.4)	2 (3.6)	
Education	Primary/middle school	84 (85.7)	14 (14.3)	0	0	0.001
	Diploma degree	44 (14.7)	121 (40.3)	118 (39.3)	17 (5.7)	
	Undergraduate degree	0	56 (20.9)	135 (50.6)	76 (28.5)	
	Masters/PhD degree	0	4 (11.5)	24 (68.5)	7 (20.0)	
Marital status	Single	18 (13.7)	42 (32.1)	60 (45.8)	11 (8.4)	0.001
	Married	99 (18.2)	146 (26.8)	215 (39.5)	85 (15.5)	
	Divorced/separated	5 (33.3)	5 (33.3)	3 (20.0)	2 (13.4)	
	Widow/widower	6 (66.7)	1 (11.1)	0	2 (22.3)	
Occupational status	Civil servant	2 (1.4)	24 (16.6)	79 (54.5)	40 (27.5)	0.001
	Unemployed	10 (32.3)	3 (9.7)	13 (41.9)	5 (16.1)	
	Homemaker	56 (26.7)	69 (32.9)	61 (29.0)	24 (11.4)	
	Retired	7 (41.2)	6 (35.3)	4 (23.5)	0	
	Student	7 (6.8)	37 (35.9)	52 (50.5)	7 (6.8)	
	Self-employed	45 (23.2)	55 (28.4)	67 (34.5)	27 (13.9)	
History of disease	No	105 (16.3)	183 (28.4)	261 (40.4)	96 (14.9)	0.001
	Yes	23 (42.5)	11 (20.4)	17 (31.5)	4 (5.6)	

Table 3: The mean score of different domains of health literacy according to the sources of health information categorized by gender (*n*=700)

Health literacy domain		Access	Reading	Understanding	Appraisal	Decision
Gender	Source of information					
Women	Physicians and health staff	69±17.6	55.6±27.4	67.3±25.3	59.3±23.4	72.5±16.8
	Internet	76±17.2	69.6±20.4	78.2±19.3	72.1±15.5	68.9±17.3
	Radio/television	67.7±15.6	63.3±24.9	71.2±21	65.9±22.5	68.7±13.1
	Newspaper/magazine	66.6±21.4	67.5±24.3	74.2±22.3	65±15.6	67.5±13.5
	Friends and acquaintances	58±12.8	44.5±19.6	60.2±18.7	51.2±19.6	64.3±16.7
	Brochure/leaflet/booklet	79.1±15.5	80.3±15.9	84.6±15.2	74.1±23.5	84.2±10.6
	Multiple choices	74.4±18.1	68.6±21.2	79.2±20	69.6±21.1	74.3±14.7
	Overall score	70±17.7	60.8±25.7	71.4±23.5	63.7±22.2	71.6±16.4
	P	0.001	0.001	0.001	0.001	0.043
Men	Physicians and health staff	66.6±22.3	53.1±23.5	61.9±24.6	57.3±21.3	68.7±20.9
	Internet	70±17.4	66.2±18.9	77.9±15	68.7±17.5	68.4±14.4
	Radio/television	67.9±16.5	55.2±26.3	70±21.5	62.1±20.9	65.8±16.3
	Newspaper/magazine	80±19	60.9±29.03	74±27.8	64±28.5	74.4±6.8
	Friends and acquaintances	50.6±24.1	41.3±23.5	50.5±25.8	50.4±26.5	47.2±24.4
	Brochure/leaflet/booklet	55.2±28.9	50±26.02	66±33.1	60.9±28.5	54.1±23.2
	Multiple choices	73.7±16.6	70.5±24.8	80±16.3	73.6±21.7	73.5±13.7
	Overall score	67.4±20.6	57.1±24.2	67.7±23.3	61.5±21.8	67.4±19.2
	P	0.020	0.001	0.001	0.001	0.001

with that of participants in Naghibi *et al.*'s[4] study. The mean scores in overall health literacy and its subscales in more than one-third of the participants were at a marginal or inadequate level.

In the study by Naghibi *et al.*,[4] >60% of the participants acquired inadequate and marginal scores in overall health literacy and all its subscales. A national survey in Iran revealed that about one-half of the Iranian population has limited health literacy.[19] Studies by Ansari *et al.*[24] and Reisi *et al.*[25] reported that the level of health literacy in 38.8% and 79.7% of their study participants was at an inadequate level, respectively. Further, more than one-half of the participants in Ghanbari *et al.*'s study[26] acquired inadequate or marginal scores in overall health literacy. Studies in other countries, even in developed countries, have also reported similar findings. A study on Spanish adults at an age range of 18–65 years revealed that 83% of the participants had an inadequate level of health literacy.[27] A study on adults aged above 18 years in the UK revealed that 52% of the participants were at a marginal level in terms of health literacy.[14]

These findings highlight the need to design and implement educational programs to improve health literacy in all communities. Such programs can be implemented through cooperation with health experts for different groups such as patients, healthy people, children, adolescents, adults, and elderly people, and at different environments such as schools, universities, health centers, hospitals, and other educational or work environments. For instance, school-based mental health literacy programs have been shown to improve the knowledge, attitudes, and help-seeking behaviors of adolescents.[28] Health literacy enhancement programs using different pieces of training are also useful approaches to improve the knowledge of health.[20] Moreover, educational interventions not only improve health literacy, but they can significantly improve health-promoting behaviors.[29] In addition to educational interventions, the role of environmental barriers should be taken into account. Therefore, further research is needed to determine the role of environmental barriers and health literacy level of health-care providers on information transfer and health literacy of recipients of health services. It is recommended that health-care providers and medical staff be aware of the level of health knowledge of their referrals and try to convey the related health information with care and patience.

In the present study, gender and level of health literacy did not show any significant relationship, which is in accordance with the studies of Mollakhalili *et al.*,[30] Naghibi *et al.*,[4] and Protheroe *et al.*[14] However, studies by Ansari *et al.*[24] and Tavousi *et al.*[19] have indicated that the level of health literacy is significantly lower in men than women. Reisi *et al.*[25] reported conflicting results. They found that the level of health literacy was lower in women than in men. The reason behind the discrepancies is not apparent; however, different target populations and data collection tools may be reasons attributable to these differences.

There was a significant relationship between age and level of health literacy. Thus, the level of health literacy in participants decreased with increase in age, which is in line with the findings reported by Naghibi *et al.*,[4] Berens *et al.*,[13] Protheroe *et al.*,[14] Ghanbari *et al.*,[26] and Reisi

et al.[25] A national survey in Iran in 2016 revealed that individuals aged 55 years and older adults had the lowest health literacy level, whereas adults in the age range of 35–44 years had the highest health literacy level.[19] It seems that younger people have more learning readiness compared to older people. It can be concluded then that seniors should be among high-priority target groups for future health literacy improvement interventions.

Findings from this study revealed that there was a significant relationship between education and health literacy level. Reasonably, similar conclusions were expected from other studies in Iran and other countries.[14,19,24] A study among adults aged 18 years and above in Yazd, Iran, revealed that with an increase in the years of schooling, the mean score of functional health literacy increased.[31] Education is one of the most critical determinants of health literacy in people. Individuals with low education have problems with comprehending and evaluating health information so that they tend to have low health literacy. As a result, these individuals fail to have a successful interaction with the health-care system. Therefore, planning and implementing educational interventions to improve the health literacy of uneducated or illiterate people should be a high priority. Nonprint media are one of the effective ways to transfer health messages to those with low practical literacy. Nonprinted sources can convey messages through images, films, or interactive computer programs. Moreover, education based on distributing flyers, pamphlets, and brochures should be replaced by face-to-face education in group meetings to improve health literacy in individuals with lower education level.

As the results indicated, there was a significant relationship between marital status and level of health literacy so that the single and married participants obtained higher scores in health literacy than widows/widowers and divorced/separated participants. A survey on the health literacy of inpatients in educational hospitals of Isfahan University of Medical Sciences revealed that single individuals had higher health literacy compared to married individuals.[30] Other studies have found similar results in different target groups.[25,32] Note that widows/widowers and divorced/separated individuals lack the motivation to attend health education classes due to psychological and spiritual problems.[33] Given the particular condition of these individuals, they need special attention throughout health literacy interventions.

The findings revealed that there was a significant relationship between employment status and level of health literacy. This is in line with the findings of other studies which have shown that civil servants, students, and self-employed individuals possess a higher

level of health literacy than unemployed individuals, homemakers, and retired individuals.[4,19,26] Similarly, another study in Iran found that civil servants and students had better performance in terms of health literacy compared to workers and retired individuals.[30] This finding can be attributed to the higher educational level of civil servants and students.

We found a significant relationship between the history of a disease and level of health literacy so that the majority of participants with adequate health literacy had no disease history. It is expected that those with a history of a disease should be more interested in gaining information about diseases and improving their health literacy; however, the results proved otherwise. According to the studies conducted by the Center for Health Care Strategies, individuals with low health literacy found the verbal and written health information hard to comprehend and had a lower chance of following the health guidelines. A study in Iran among patients with heart failure indicated that patients had moderate health literacy in all subscales of health literacy, and low health literacy was found to be a fundamental barrier in education and self-care management of patients with chronic diseases.[34] A study among elderly people in Kerman, Iran, found that health responsibility and self-care behaviors require appropriate health knowledge,[35] and this can be strengthened by appropriate educational interventions.[35,36]

As we mentioned earlier, the health literacy level of participants in the present study was higher compared with participants in another similar study.[4] It is notable that the city under study is home to two universities (the Islamic Azad University and Payame Noor University). Further, the city is not considered an industrial city. Thereby, the majority of the citizens are students and work as office employees, or seek for office jobs. The majority of the employed individuals also have completed at least a high school diploma. Thus, the higher level of health literacy in the participants of this study was expectable.

The most frequently used resources for gaining health information were physicians, followed by health staff. Another study among 18–65-year-old adults in Karaj revealed that radio and television, followed by physicians and health staff, were the primary sources of health information.[37] Therefore, given the role of physicians and health staff in providing health information to people, it is essential to provide communication skills training to them continuously to ensure proper communication between physicians and people. Moreover, it is imperative to make sure that people receive updated, scientific, and correct information. Taking into account the role of the Internet

as the primary source of information to the public, all health-related organizations need to keep their websites updated in terms of health information.

Conclusion

The health literacy of 49.5% of the participants was at an inadequate and marginal level. Therefore and according to the results of other studies in Iran, it seems that there is a long way to a desirable condition of general health literacy in Iran. It seems indispensable to design and implement a variety of educational programs to improve the general health literacy of the Iranian people. The educational programs can target different populations, including healthy individuals and patients, in all age groups, including children and seniors. Given the limited resources of health-care systems, educational programs need to focus on groups with higher priority such as elderly people, people with lower educational levels, widows/widowers and divorced/separated people, unemployed and retired people, homemakers, and people with a history of a disease. By highlighting the factors associated with health literacy in individuals, the present study can provide the ground for future health interventions aimed at improving health literacy.

Strengths and weaknesses

This study is the first study which used the HELIA questionnaire to assess the overall and different subscales of health literacy and its associated demographic factors in adults in Bardaskan city. By including the domains of health literacy, the HELIA questionnaire provides a more comprehensive assessment of health literacy compared with the Newest Vital Sign (NVS), Short Test of Functional Health Literacy in Adults (S-TOFHLA), and Test of Functional Health Literacy in Adults (TOFHLA) questionnaires.[21,38] Large sample size and careful data gathering are other strengths of the study. However, this study has several weaknesses that require consideration. This study determined the level of health literacy and its associated demographic factors among literate adults of Bardaskan city. Therefore, the results can only be generalized to the literate urban population of Bardaskan. Further, it was not possible for us to measure the impact of variables such as cultural background and economic and social factors which affect the health literacy levels of the population.

Conflicts of interest

There are no conflicts of interest.

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