

Health Literacy Predicts Readiness to Behavior Change in The Iranian Adult Population

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ABSTRACT

Background and Objectives: Health literacy requires the knowledge, motivation, and competence to access, understand, evaluate and apply health information to make judgments and decisions in daily life and to be prepared for the change to maintain or improve quality of life throughout life. This study aimed to investigate the health literacy level in the Iranian adult population (18-64 years old) and its relationship with behavior readiness.

Materials and Methods: In this cross-sectional study, 898 people who live in Southwest of Iran participated in the study in February 2022. The random sampling method was simple. According to the number assigned to each client covered by the health center, the online link of the questionnaire was sent to their mobile phone through SMS and WhatsApp. Data were analyzed by SPSS25.

Results: Only 30.3% of the subjects had excellent health literacy and 46.5% had adequate health literacy. The mean score of readiness for behavior change was 92.68 ± 13.31 . Health literacy had a positive and significant correlation with readiness for change ($r = 0.405$, $P < 0.001$). In general, health literacy alone predicted 16.8% variance of behavior change readiness ($R^2 = 0.168$, adjusted $R^2 = 0.167$, $P < 0.001$).

Conclusion: In general, health literacy in adults is insufficient. However, promoting health literacy may facilitate readiness to change health behaviors.

Paper Type: Research Article

Keywords: Health Literacy, Readiness to Change, Adult Population.

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Introduction

Recently health literacy has shifted from the margins to the mainstream of health research because of its relationship to quality of care, disease prevention and quality of life. Health literacy includes a set of skills of reading, listening, analysis, decision making and the ability to apply these skills in health situations (1). Health literacy has been introduced as a global issue and discussion. Accordingly in a report the World Health Organization (WHO) introduced health literacy as one of the biggest determinants of health (2).

Although it is not yet clear to what extent health literacy affects health outcomes there are many reasons why many unpleasant health-related outcomes are inadequate as a result of health literacy (3). Therefore researchers and policymakers recommend evaluating health literacy, identifying vulnerable groups and developing interventions to improve health literacy accordingly (3). People with low health literacy are less likely to understand the written and spoken information provided by health professionals and follow the instructions given. Therefore, they have a poorer health status and are more likely to be hospitalized and see a doctor. They also have poor self-care skills and less preventive care and as a result incur higher medical costs (2, 4).

One study found that despite the relatively educated population the prevalence of inadequate health literacy remains high. Inadequate health literacy is strongly associated with low socioeconomic status, poor health, inactivity and overweight but is relatively less associated with health behavioral factors such as smoking and heavy alcohol consumption (4, 5). Ezdi Rad in 2014 showed that there is a relationship between the level of health literacy, performing preventive behaviours and general health status (6). A study

in Afghanistan showed that health literacy (among the educated and illiterate) has been reported to be low even compared to other Asian countries (3). However, in another study in Denmark men, younger people, people with basic education or lower income had insufficient health literacy and among the health behavior factors only physical activity behavior was associated with insufficient health literacy. Also obese people had lower health literacy scores. (4). In the same direction the study of health literacy in Asian countries did not show good results (7).

Low health literacy in patients even more than one year after discharge were significantly related with mortality and all causes of death (8). It seems that health literacy is different in age groups (4). A study found health literacy of Iranian adult was low (5). Existing health literacy research on the contribution of health literacy to health behaviors is unclear and limited (9). A national study in Iran in 2015 showed that about 44% of people have limited health literacy. (10). Evidence shows that there is a positive relationship between health literacy and behavior change (11). In other words, aspects of health literacy may have related to health status and behavior. Given the impact of health literacy on preventive behaviors improving health literacy levels may lead to changes in people's behavior (12).

Health literacy can help us to prevent health problems, protect our health and better manage health problems when they occur (13). In the health literacy national study people in southwest of Iran was not investigated and no information is available on the health literacy of the adult population in southwestern Iran. Accordingly, this study was conducted to investigate health literacy and readiness to change unhealthy behavior in the urban population (18-65-year-old) in southwestern Iran (Abadan, Khorramshahr and Shadgan).

Materials and Methods

The study is cross-sectional. The sample size based on the formula to estimate the ratio of an attribute in a community and confidence level 95% , $\alpha = 0.05$, $\beta = 80$ and P in Borji et al study (2015), 291 urban adults aged 18-65 years were obtained (14). Considering 3 cities covered by Abadan Faculty of Medical Sciences, 873 people were determined as the base sample size. With a probability of 20% of samples falling the main sample size was estimated 1003 subjects. Based on the names list of clients covered by urban health center people were selected by simple random method. According to the number assigned in random sampling the online link of the questionnaire was sent to the phone number of the participants through SMS and WhatsApp. Finally, out of 1003 subjects 898 answered the questionnaire completely in February 2022.

Inclusion criteria: resident of an urban area and literacy to the extent of reading and writing.

Exclusion criteria: Cognitive, psychological, physical and movement problem and perceptual disorders and incomplete completion of the questionnaire.

Data collection tools: The first part contains demographic information including age, gender, education, occupation, and marital status.

The second part included the Health Literacy Assessment Questionnaire for 18-65 years old adults (HELIA), which was evaluated psychometrically by Montazeri et al (13). This questionnaire has 33 items with five options and in five dimensions: reading (4 questions), access (6 questions), understanding (7 questions), evaluation (4 questions), and decision making and behavior (12 questions). The scoring scale is such that in questions related to reading skills; Scores of 5, 4, 3, 2, and 1 are assigned to "Absolutely Easy, Easy, Not easy - Not Hard, Hard, and Completely Hard". On other aspects

of health literacy; Scores 5, 4, 3, 2, and 1 are assigned to the options "Always, Most often, Sometimes, Rarely, Not at all, or Never". The scoring method of this tool the first was the raw score of each person in each of the areas was obtained from the algebraic sum of the scores, then to convert this score to the range of 0 to 100 from the raw score difference formula obtained from the minimum possible raw score. Divided by the difference of the maximum possible score, the minimum possible score was used. Finally, to calculate the total score, the scores of all dimensions (based on the range from zero to 100) are added and then divided by the number of dimensions (number 4). Scores from 0 to 40 are considered as inadequate health literacy, 40.1 to 44 as insufficient health literacy, 44.1 to 85 as adequate health literacy, and scores from 85.1 to 100 as excellent health literacy (15).

Readiness to Change and Well-Being Questionnaire

The questionnaire was designed in English by the psychological coaching manual book (Margaret Moore 2015) in cooperation with the American College of Sports Medicine (16). We removed the section of information related to public health due to the similarity with the demographic questionnaire and we provided it to the panel of experts (8 people such as health education and health promotion specialist, epidemiology and health service management). The shortened form of this questionnaire contains 15 questions (3 questions for each dimension) and includes sections on life satisfaction, weight management, physical activity, nutrition, general health (readiness for change or improvement, scores of 5-1 importance for change, and self-confidence of each is 1-10) on a Likert scale. In this study, the reliability of $\alpha = 0.74$ was obtained. $CVR = 0.78$ and $CVI = .074$ were also calculated.

Results

Most of the subjects were in the age 28-37 years old (31.3%) and 54.8% were men, 45.2% women and 63.1% had a university degree. Also, 64.9%

were married and 47.8% were employees. A number of them (34.6%) obtained health-related content through WhatsApp and Telegram (Table 1).

Table 1: Demographic characteristics of 18-64-year-old subjects

Variable	N= 898	Frequency	Percent	Variable	N= 898	Frequency	Percent
Age	18-27 year	276	30.7	Education level	Elementary school	567	63.1
	28-37 year	281	31.3		junior	16	1.8
	38-47 year	246	27.4		high school	76	8.5
	48-57 year	76	8.5		Diploma	239	26.6
	58-64 year	19	2.1		Academic	567	63.1
Job	Employee	429	47.8	Source of health & disease information	Internet	156	17.4
	worker	61	6.8		Educational brochure	16	1.8
	self-employment	117	13.0		Friends & acquaintances	20	2.2
	Retired	11	1.2		radio and TV	92	10.2
	housewife	132	14.7		WhatsApp, Telegram, Instagram	311	34.6
	Unemployed	148	16.5		Physician & health staff	303	33.7
Marital status	Single	294	32.7				
	Married	583	64.9				
	Divorced / dead spouse	21	2.3				

Based on a self-report the subjects reported that they were suffering from some chronic diseases as diagnosed by the doctor. therefore 19.8% of subjects had blood sugar scores above 126 and 6.3% had blood pressure scores above 130. Some subjects (18.7%) had cholesterol above 240 and 39.4% were overweight based on body mass index. The mean weight of the subjects was 18.5 ± 74.83 kg. The results of this study showed that only 30.3 subjects had excellent health literacy and 46.5 had adequate health literacy (Table 2). The overall score of readiness for behavior change was 92.68 ± 13.31 (119-33). "Inadequate" and "Not much enough" health literacy was 19.8% higher in men than in women. However adequate and excellent health literacy was reported in women more than men. Inadequate health literacy was also

higher in subjects with high school diplomas (11.8%).

Table 2: Frequency distribution of health literacy level

Healthy literacy level	Frequency
inadequate health literacy	36(4)
not so adequate healthy literacy	172 (19.2)
adequate healthy literacy	418(46.5)
Excellent health literacy	272 (30.3)

"Not much enough" health literacy was higher among those with a primary education level (43.8%). Only 21.5% of academics had excellent health literacy. Housewives had "Inadequate" health literacy (6.1%). Statistical tests showed that some demographic variables are related to health literacy and willingness to change behavior (Table 3).

Table3: Relationship between different dimensions of health literacy with demographic variables

Variable	Health Literacy p-value	Readiness to Change p-value
Age	p=0.002	p< 0.001
Sex	p< 0.001	p= 0.996
Education level	p=0.144	p< 0.001
Marital status	p=0.26	p< 0.001
Job	p< 0.001	p< 0.001
Source of health & information	p< 0.001	p=0.002
Blood pressure	p< 0.001	p=0.654
Fasting blood sugar	p< 0.001	p< 0.001
Cholesterol	p< 0.001	p< 0.001

“Inadequate” and “Not much enough”

health literacy was more seen among people with blood sugar scores above 125-100 and higher (4.4% and 19.1%). Also people with laboratory cholesterol levels above 240 had “Not much enough” health literacy (20.8%). People with a blood pressure score above 130 mm Hg (22.8%) had “Not much enough” health literacy. Most subjects with “Inadequate” and “Not much enough” health literacy received health information from WhatsApp, Telegram and Instagram. The results of the readiness for change questionnaire showed that only 25% or more of the subjects recently planned for more satisfaction with life, physical activity and consumption of healthy foods. (Table 4).

Table4: Frequency distribution of readiness to change questionnaire

Readiness to change	life satisfaction	Weight improvement	PA level	Healthy food	Health management
I have no current interest in change	64(7.1)	65(7.2)	82(9.1)	59(6.6)	42(4.7)
I am planning to change in the next 6 months	87(9.7)	66(7.3)	88(9.8)	59(6.6)	64(7.1)
I'm planning to change this month	221(24.6)	259(28.8)	362(40.3)	229(25.5)	246(27.4)
I recently started my action in this field	232 (25.8)	241(26.8)	123(13.7)	226(25.2)	230(25.6)
I now maintain consistently(6 months +)	294(32.7)	267(29.7)	243(27.1)	325(36.2)	316 (35.2)
My importance for having a high level	1*	2	3	4	5
life satisfaction	52(5.8)	52(5.8)	96(10.7)	312(34.7)	386(43)
Weight improvement	573(63.8)	184(20.5)	63(63.8)	42(4.7)	36(4)
PA level	39(4.3)	44(4.9)	113(12.6)	392(43.7)	310(34.5)
Healthy food Consumption	37 (4.1)	29(3.2)	72(8)	419(46.7)	341(38)
Health management	30(3.3)	25(2.8)	74(8.2)	117(13)	625(72.6)
My confidence in the ability to achieve & maintain of	**1	2	3	4	5
life satisfaction	39(4.3)	34(3.8)	97(10.8)	394(43.9)	334(37.3)
Weight improvement	36(4)	48(5.3)	87(97)	349(38.9)	378(42.1)
PA level	35(3.9)	50(5.6)	110(12.2)	416(46.3)	287(32)
Healthy food Consumption	27(3)	28(3.1)	85(9.5)	431(48)	327(36.4)
Health management	29(3.2)	20(2.2)	83(9.2)	413(46)	353(39.3)

*1= unimportant, 2= Low importance, 3= Moderate importance, 4= Important, 5= Most important

**1= Very low confidence, 2= low confidence, 3= Moderate confidence, 4= high confidence, 5= very high confidence

The results showed that the subjects who had no readiness to improve weight were had adequate health literacy (62.4%). Only 4.4% of people with excellent health literacy had high

confidence to change weight. Physical activity was very important for 57.7% of people with high health literacy. physical activity in people with not so adequate health literacy was more

important than other subjects (55.2%). Also confidence to do physical activity were more in the subjects with not so adequate health literacy than others. Good life satisfaction was very important for 46% of people with excellent health literacy. subjects with adequate health literacy (73.2%) health management was very important to them but only 30.4% of them had high confidence to change.. Spearman correlation test showed that health literacy has a positive and significant correlation with readiness for change. ($r = 0.405$, $P < 0.001$). All dimensions of health literacy were positively and significantly correlated with each other. The dimension of understanding showed the highest correlation with behavior ($r = 0.529$, $P < 0.001$) and the scope of assessment showed the strongest correlation ($r = 0.660$, $P < 0.001$). Overall, health literacy alone predicted 16.8% variance readiness for change ($R^2 = 0.168$, adjusted $R = 0.167$, $P < 0.001$). Health literacy dimensions also predicted 27.9%, readiness for change in the adult population ($R^2 = 0.279$, adjusted $R = 0.275$, $P < 0.001$) among which behavior was the strongest predictor of readiness for change.

Discussion

In the present study we examined health literacy and readiness to change unhealthy behavior in the urban population (18-65 years old) in southwestern Iran. In the present study health-related content was obtained through WhatsApp and Telegram. With the growth of technology in recent years, social networks have become a platform for knowledge dissemination, exchange of medical information with peers, and interpersonal communication, and have become a substitute for health professionals and physicians (17). However they are often misused. Most subjects with "Inadequate" and

"Not much enough" health literacy received health information from WhatsApp, Telegram and Instagram. In contrast excellent healthy literate subjects were the source of information for health workers and physicians. Therefore with proper and appropriate planning the extraordinary potential of communication channels can be used to convey appropriate health messages to increase awareness change attitudes and also encourage citizens to participate in preventive behaviors. Our findings are similar to other research (18, 19). In the present study 4% of subjects had inadequate health literacy and only half of the subjects had sufficient health literacy and one third of them had excellent health literacy. Our findings are consistent and inconsistent with other research (20-23).

Inadequate and not so adequate health literacy was higher in men. The findings of the present study are consistent with the study of Tavousi et al (10). One of the possible reasons for increasing the level of women's health literacy is searching for health information on the internet and some of them referring to health centers and obtaining educational content and using more health information (4). It seems that women follow health recommendations more than men. Generally, women are more sensitive to health recommendations and more inclined to learn health issues. Health literacy is an issue can affect women's knowledge and ability to adhere to health and clinical care and health outcomes (24). This findings are similar to the large study of Danish adult health literacy (4, 24, 25). In the study of readiness for change almost a one-third of the subjects tried to maintain satisfaction good life, health management, weight improvement and physical activity level continuously (more than 6 months). Having a high level of achieving good life satisfaction, health management, weight improvement and physical activity level were

not important for participant. In particular the low readiness among the participants for weight improvement and physical activity was not important for some of the subjects. It seems that people are not ready enough to change their health-related behaviors (26). Possibly other factors apart from health literacy have an effect on the readiness to improve weight. Maybe people with adequate health literacy are looking for stress management related to eating. So in this regard it is necessary to pay attention to emotional stimuli (27). It was expected that this group of subjects have a better insight into their weight improvement. However our results are inconsistent with others and consistent with one study (27-29). For some people with good or poor health literacy physical activity is somewhat important. However, the confidence level for changing physical activity behavior is moderate or low. Studies show that adults with inadequate health literacy had 38% less physical activity per week than adults with adequate health literacy and there is a positive relationship between physical activity and health literacy (30, 31). Health literacy can empower people to make choices about their physical activity(32). Inadequate health literacy can negatively affect personal motivation, self-efficacy or the knowledge required to implement appropriate self-care behaviors (31). health literacy level initiatives can be a useful tool in health management and it is better to be integrated in family, community and school health programs (32). We found the significant relationship between all dimensions of health literacy. perhaps all of these dimensions with the help of each other can affect the readiness to change(15). However the dimension of understanding showed the greatest correlation with behavior. Understanding health concepts may improve health-promoting behaviors (33). Among the demographic variables

level of education and marital status were not related to health literacy. This may be due to the large number of academically educated people participating in the study and their marriage. Our results are inconsistent with the study of Raisi and similar to Khademi research (5, 34). In the present study blood sugar, cholesterol and hypertension scores were associated with health literacy and were found among people with "Inadequate" and "Not much enough" health literacy. These risk factors are chronic diseases and their management is very complex and requires skills related to health literacy (reading, comprehension, and evaluation) that can be important tools to help chronic health conditions (35, 36). In the present study health literacy was correlated with readiness for change. It seems that with the change in health literacy level a person's readiness to change health behavior also changes(12). Behavior change is a gradual process and preparation and self-confidence are required before action(12, 37). Health literacy was predicted 16.8% of variance of readiness to change in the adult population. our finding is similar to Rague et al (38). Health literacy has been consistently shown to be significantly related to various other health outcomes(11). Probably mental functions will keep people in favorable physical and emotional conditions and people with more preparation can learn faster and better the materials related to health, and self-care behaviors (39). The strength of the current study was the production of evidence related to the level of health literacy and its relationship with readiness to change in the southwest of Iran which did not available until now. We had limitations in doing this research. One of the limitations of this study was that the questionnaire was online and we received many incomplete answers. Also, due to people's lack of trust in text messages containing online

links, we did not receive a response from some people.

Conclusion

Health literacy is a dynamic and rapidly changing concept. Despite the modernity of society, the health literacy of adult population was not high. In addition, people with abnormal indicators (blood sugar, cholesterol, etc.) did not have adequate health literacy. Searching health content on social networks may have exposed them to false information. However, the role of health experts in health education should be strengthened. Considering the higher health literacy of women in the present study, they may be able to use this literacy in self-care. Finally, readiness to change may be enabled by health literacy. However, more research is needed in this area.

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