International Journal of Information Science and Management
Vol. 16, No. 1, 2018, 137-151

Evaluating the Health Literacy Level among Diabetic Patients Referring to Shiraz Health Centers

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Abstract

Diabetes is one of the main causes of death and around 4.5-5 million people suffer from it in Iran. Therefore, having information about this disease and self-care activities is essential. It seems that measuring the level of health literacy is important. This research aims to investigate the appropriateness of the available information and educational resources as well as the level of the health literacy of diabetic patients attending health centers in Shiraz (Iran).In this descriptive research, some available information resources were prioritized by diabetic patients, and educational planes were chosen to assess their appropriateness. The study population included 400 diabetic patients who were selected through stratified random sampling. Their level of health literacy was measured by TOFHLA questionnaire. The findings showed that 87.5% of the patients had regular doctor appointments as a resource for getting information; however the information given by the physicians are little and the level of the patients` health literacy is in marginal level. Marginal health literacy is a threat for diabetics whereas they need to have adequate knowledge and skills about controlling and improving their disease; thus, providing understandable information and educational materials for patients is expressed as a way to enhance their health literacy level. Based on their knowledge and skills hospital librarians, can work as health literacy educators in health centers and hospitals, and as role-players in promoting health literacy community.

Keywords: Diabetics, Health Literacy, S-TOFHLA, Health Centers, Consumer Health Information

Introduction

Access to simple and understandable information about the disease, different treatments and side effects of each treatment, and involvement in the selection of treatment are among

the main right of patients. Therefore, modern health systems create new roles and expectations for patients. Unlike the past that patients were not allowed to access the health information, in the new health systems, there are trends into searching information by the patients in order to maintaining health, prevention of diseases, enhancement of the quality of life, experience of low anxiety when they face a disease, and participation in the health care programs. Patients' knowledge and skills in health context from the infrastructure of these demands, which is called "health literacy" (Beauchamp & Childress, 2007). Health literacy has been defined as: "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (Zarcadoolas, Pleasant, & Greer, 2005). The underlying causes of this concept were social political changes such as women's and citizenship rights movements in the 1960s, as well as the movement in the medical rules and ethics, with an emphases on the patients' independence, which, finally, created changes in the roles, expectations and relationship between patients and physicians (Beauchamp, Childress, 2007, Charles, Gafni, & Whelan, 1997). This new concept was posed, for the first time, in an article in 1974 but was not considered for two decades (Ghanbari, Majlessi, Ghaffari, Mahmoodi & Majdabadi, 2012).

Finally, this concept was entered into the health context by Kickbusch's article in 1997 (Sorensen, 2013). Then Nutbeam pointed to this term in the health Promotion Dictionary, and expressed that health literacy is one of key consequences of health education (Kinding, Panzer & Nielsen-Bohlman, 2004). Low health literacy refers to multiple types of adverse health consequences and inappropriate use of health services (Kutner, Greenburg, Jin, & Paulsen, 2006). These outcomes include higher hospitalization rates, greater use of emergency care, higher rates of medication adherence, less ability for consuming drugs, lower rates of using preventive services, and not understanding most of drug labels and health messages (Chew, Bradley, & Boyko, 2004). People with low health literacy have little knowledge about their medical conditions and treatment. They are not able to understand the verbal and written information given by their physicians, nurses and health professionals. In addition, they cannot act according to the medical procedures and orders; they are not also able to get their required health services. Use of patient education material is a way to promote health literacy. These resources include up-to-date information about disease, prevention, treatment and health relief. They are meant to support the patient`s education programs, especially in treatment of chronic diseases; which need self-care (Coulter, Ellins, Swain, Clarke, Heron, Rasul, et al 2006).

The right information given to the right person at the right time has a big impact on his/her well-being; it can also effect on the health outcome. Users' knowledge and recall can be improved by high-quality patient information; by this, they are more involved in the decision making process, and their overall experience of health care is extensively increased(Khosravi, Ahmadzade, Arastopoor, & Tahmasebi, 2013). The central function of libraries is providing information, and health librarians are skilled in accessing and applying healthcare information.

Diabetes is a chronic disease, which is recognized as an important risk factor for more severe and progressive infections, especially in the developing countries. As heart disease and stroke, vision loss and blindness, kidney diseases are the effects of diabetes, this disease is the fifth leading cause of death in the world, and about 8.3 million people die each year due to diabetes (Smith, & Duman, 2009). Therefore, prevention and control of this disease must be

considered as a priority of health programs.

During the last three decades of emerging health literacy, several researches investigation have been done to discover how people's health status is affected by health literacy (Sadeghie Ahari, Arshi, Iranparvar, Amani, & Siahpoosh, 2008). These researches have examined the health literacy as an effective variable in health status, treatment outcome, and the relationship between physician and patient. Some researchers have shown that patients' health literacy is inadequate. They found that individuals with inadequate health literacy are more likely to report difficulties in their daily activities (Smith, Dixon, Trevena, Nutbeam, & McCaffery, 2009; Davis, Williams, Marin, Parker, & Glass, 2002; Schillinger, Grumbach, Piette, Wang, Osmond, Daher, et al. 2002; Williams, Davis, Parker, & Weiss, 2002; Wolf, Gazmararian, & Baker, 2005). People with limited health literacy are also far more likely to go to the doctor or healthcare. Patients with inadequate health literacy have difficulties in understanding the words and terminology used by physicians (Sudore, Mehta, Simonsick, Harris, Newman, Satterfield, et al. 2006). Jibaja-Weiss and et al examined the role of health literacy in making decision regarding treatment, and documented that patients with adequate health literacy want to be involved in the treatment decision making process (Jibaja-Weiss, Volk, Granchi, Neff, Robinson, Spann, et al. 2011). Some studies have demonstrated that patients tend to obtain information about their disease and treatment; they considered physicians and information on the web as their most important sources of information (Jibaja-Weiss, Volk, Granchi, Neff, Robinson, Spann, et al. 2011; O'Connor, & Johanson, 2000; Chen, & Siu, 2001; Britigan, Murnan, & Rojas-Guyler, 2009). Different researchers (Briggs, Jordan, Buchbinder, Burnett, O'Sullivan, Chua, et al. 2010; Eysenbach, Powell, Kuss, & Sa, 2002) have evaluated the quality of health information on the web, and found that the quality of this information is a problematic issue. Some recent researches assessed the association between health literacy and the chronic diseases like elevated blood pressure, obesity, renal insufficiency, asthma, and diabetes (Kunst, Groot, Latthe, Latthe, Khan 2002; McNaughton, Kripalani, Cawthon, Mion, Wallston, & Roumie, 2014; Chari, Warsh, Ketterer, Hossain & Sharif, 2014; Federman, Wolf, Sofianou, Martynenko, O'Connor & Halm et al. 2014). Limited health literacy has bad effects on chronic diseases.

This issue has been posed for 5 years in Iran and there are a few studies on this topic (Khosravi, Ahmadzadeh & Ahmadzadeh, 2014). Due to the importance of health literacy, this paper assessed the appropriateness of available information resources for diabetic patients referring to Shiraz health centers in Iran as well as the level of their health literacy for better health planning. There are several tools for measuring the health literacy level but TOFHLA and REALMS are two most popular tests (Piatt, Valerio, Nwankwo, Lucas, & Funnell, 2014). Therefore, we chose to use short TOFHLA for investigating the level of the health literacy of diabetic patients attending the health centers in Shiraz.

Methods

This descriptive study was conducted at 12 urban health centers during a 2-month period from July to August 2013. The population included all diabetics who attended the urban health centers in Shiraz during the mentioned period. Based on the Morgan table, 400 diabetic patients referring to Shiraz health centers were selected through stratified random sampling. They had ability to write and read. They had to fill in two different questionnaires. The face validity of these two questionnaires was confirmed by eight experts in health education and

promotion as well as six experts in medical library and information science. The reliability of the questionnaires was calculated through internal homogeneity and Cronbach' Alpha coefficients. First, we asked to answer two questionnaires; one having items about information and educational resources the participants use, and the other based on S-TOFHLA.

In this research, we asked the diabetic patients give their opinion about usage, priority and appropriateness of these resources.

Next, Test of Functional Health Literacy in Adults (TOFHLA) questionnaire was used to assess their functional health literacy. It consists of two domains: reading comprehension (50 items) and numeracy (17 items) based on excerpts from the texts commonly encountered in a hospital. Reading comprehension test uses a modified Cloze-type procedure where the patient is asked to read the text and fill in, every fourth or seventh word is missing and multiple choice options of four words are available to choose the most appropriate word for the space. The questionnaire included reading comprehension with nine questions about "patient preparation instruction for radiology", twelve questions about "patient rights", and eight questions that assess the "responsibilities in health insurance form and the hospital's treatment consent form".

The second section of TOFHLA measures the patient's numeracy skills. These skills are necessary to understand the physician's orders that require calculation. It contains 17 questions. There are 10 explanations about the prescribed medications, date and time of next the doctor's appointment, and medical test results interpretation that have been prepared as a card. Each explanation has some questions. Each card is read by the participants and then answers are given to questions related to the explanations.

TOFHLA is a timed test and requires up to 22 minutes administering. The total score is 100 (50 scores for reading skills and 50 scores for numeracy skills. The numeracy score is multiplied by a constant of 2.941 to create a score from 0 to 50) and individuals may be classified into one of three categories: inadequate (0-59), marginal (60-74) and adequate (75-100) (Baker, Williams, Parker, Gazmararian, & Nurss, 1999).

We collected some socio-demographic data (age, sex, education, job, family history of disease, and disease history of the patients by means of a questionnaire. we further examined the patients performance for educational resource usefulness by sex.

Finally, the health literacy dimensions across demographic features and diabetes association membership were compared.

The analysis of data was done by the SPSS software (ver. 20) using descriptive and analytical statistics. Independent t-test was employed to test significance between health literacy and sex or diabetes association membership. One-way analysis of variance (ANOVA) was used to test significance between health literacy and education, family disease history, and job.

For the assessment of faced validity of this questionnaire, the viewpoints of professors and experts have been used. In order to assess the questionnaire's reliability, Cronbach's alpha was calculated (α=0.874).

Pearson's correlation test was applied to test the correlation of health literacy with age and disease history.

Results

Totally, 343 out of the 400 questionnaires distributed were returned back to the researchers. Among these 343 diabetic patients participated in this study and 61.8% of them were women. The range of patient's age was from 23 to 78 years, and 38.7% of them were in the range of 50 to 59 years. The disease history was ranged from 1 year to 29 years with the average of 6 years. About 37.6% of the participants did not have family history of disease; however, 62.4% had family history of disease in the first and second-degree relatives. Most of the patients (32.7 %) had a high school education. Patient demographics are summarized in Table 1.

Table 1
Characteristics of the study participants

Socio-demographic	Number	Percent
Sex		
Female	212	61.8
Male	131	38.2
Age (year)		
29<	6	1.8
30-39	38	11.3
40-49	107	31.1
50-59	133	38.7
60-69	49	14.3
<70	10	3
Disease history (year)		
5<	200	58.3
6-10	83	24
11-15	31	9
16-20	20	5.8
21-25	5	1.4
<26	4	1.1
Family history of disease		
Non-relative	129	37.6
First degree relative	203	59.2
Second degree relative	11	3.2
Education		
Reading and writing ability	10	2.9
Elementary	71	20.7
Secondary	71	20.7
High school	112	32.7
Bachelor's degree and higher	44	12.8
Job		
Housewife	172	50.1
Employee	59	17.2
Non-government	58	16.9
Teacher	42	12.2
Army	12	3.5

About 27.7% (n=95) of the study participants were the member of Shiraz Diabetes

Association. Shiraz Diabetes Association and health centers offer diabetes educational classes for these patients, and 30% (n=103) of the participants attending the classes evaluated these classes somewhat useful by 16.9% (n=58) of patients who had participated in the classes. The results showed that 30.3% (n=104) of patients had access to educational resources about diabetes. These resources were provided by the Diabetes Association or health centers or the patients had purchased themselves. About 53.7% (n=58) of the patients evaluated these resources somewhat useful. In terms of regular doctor appointment, 87.5% (n=300) of the patients visited the doctor regularly once a month or every two, three or six months. However, 37.9% (n=130) expressed that the information given by the physicians is not enough. Details of the patients' attitudes about educational classes and resources by sex are shown in Table 2.

Table 2
Details of the patients` attitudes about educational classes and resources

Variable	Number and percent according to sex				Total	
	Female		Male			
	Number	Percent	Number	Percent	Number	Percent
Diabetes Association membership						
Yes	67	19.5	28	1/8	95	7/27
No	145	42.2	103	30	248	3/72
Participate in the class						
Yes	70	20.4	33	9.6	103	30.1
No	142	41.3	98	28.5	240	69.9
Classes' usefulness						
Completely	24	22.2	10	10.1	34	32.3
Somewhat	42	38.8	16	14.8	58	53.7
Little	3	2.7	7	5.5	10	8.3
Without answer	1	0.9	0	0	1	0.9
Access to resources						
Yes	72	20.9	32	9.3	104	30.3
No	140	40.8	99	28.8	239	69.7
Resources' usefulness						
Completely	19	17.7	11	10.2	30	27.9
Somewhat	36	33.6	19	17.7	55	51.3
Little	17	15.8	4	3.7	21	19.5
Regular doctor appointment						
Yes	187	54.5	113	32.9	300	87.5
No	25	7.2	18	5.2	43	12.5
Given information by the physician						
Completely	42	1.1	40	11.6	90	26.2
Somewhat	74	21.5	38	11.3	123	35.9
Little	71	19.8	35	10.1	130	37.9

The first question of the study was posed in order to identify and prioritize the diabetic patients' information resources. 63.6% of the patients selected physician as the first reference to get required information. More details are given in Table 3.

Table 3
Number and percent of information resources

Information resources	Number	Percent
Radio	8	2.3
Internet	4	1.2
Friends	5	1.5
Diabetes Association	13	3.8
Family members	20	8.5
Health center	23	6.7
Television	24	7
Personal studies	28	8.2
Physician	218	63.6
Total	343	100

The purpose of the second question was acquiring the level of the health literacy of Shiraz diabetic patients. The gathered data showed that the minimum score in the reading comprehension section was 1, and the maximum score was 49. In numerical section, the minimum score was 3 and the maximum score was 50. Totally, the lowest score of health literacy was 17 and the highest was 99. The average of the diabetic patients' health literacy was 66 (see Table 4).

Table 4
Functional health literacy

Functional health literacy											
Reading comprehension				Numerical ability				Total			
Mean	Std deviation	Min	Max	Mean	Std deviation	Min	Max	Mean	Std deviation	Min	Max
34	10/5	1	49	31	10/3	3	50	61	18	17	99

According to the range of health literacy scores, the patients were classified into inadequate health literacy (over 15), marginal (between 60 and74) and inadequate health literacy (less than 60). The data analysis showed that 41.4% (n=142) of the patients had adequate, 23.6% (n=81) had marginal and 35% (n=120) had inadequate health literacy. The average score of the health literacy level of participants in this study was 66, showing the marginal health literacy level (see Table 5).

Table 5
Health literacy level of the study participants

Health literacy level					
Adequate		Marginal		Inadequate	
Number	Percent	Number	Percent	Number	Percent
142	41/4	81	23/6	120	35

Comparing the dimensions of health literacy (reading comprehension and numeracy) in both sex groups showed that males had higher health literacy than females (PV= 0/01). This difference was more significant in the numerical section (PV= 0/001) (see Table 6).

Table 6
Relationship of health literacy and its dimensions with sex

	Male			Female			T-Test Coefficient	DF	significance
	Number	Mean	Std deviation	Number	Mean	Std deviation			
Reading comprehension	212	33/81	1/540	131	35/35	10/93	1/313	341	0/190
Numerical ability	212	30/26	3/761	131	34/03	5/59	3/319	341	0/001
Health literacy	212	64/08	5/301	131	69/38	18/18	2/602	341	0/010

Other results indicated that there is the reverse relationship between age and health literacy. In terms of age group, the highest health literacy score belonged to the less than 29 years age group, and the lowest was found in over the 70 years age group. Pearson`s correlation test that showed a significant correlation (PV= 0.007), which was more significant in the reading comprehension section (Pv= 0.001) (see Table 7).

Table 7
Relationship of health literacy and its dimensions with age

	Pearson's correlation coefficient	Significance
Reading comprehension	-0/184	0/001
Numerical ability	-0/073	0/178
Health literacy	-0/146	0/007

Comparison of the mean scores of health literacy in educational degree using one-way variance analysis (ANOVA) revealed that people having higher education level had higher health literacy. The average of patients health literacy in bachelor's degree and higher was 82.1 (Pv=0/000) (Table 8).

Table 8
Relationship of health literacy and its dimensions with education

	Number	Percent	Mean	Std deviation	F coefficient	Df between groups	Df within groups	Significance
Reading & writing ability	10	2/5	47	9/20	30/049	5	337	0/000
Elementary	71	20/7	50	16/40				
Secondary	71	20/7	63	17/79				
High school	112	32/7	69	15/96				
Associate D.	35	10/2	74	12/12				
Bachelor's D	44	12/8	82	11/59				

In addition, the ANOVA results showed a significant difference between the patients' health literacy and their job. Teachers had the highest health literacy, and homemakers had the lowest (Pv=0/000) (Table 9).

Table 9
Relationship of health literacy and its dimensions with job

	Number	Percent	Mean	Std deviation	F coefficient	Df between groups	Df within groups	Significance
Housewife	42	12/2	77	12/25	6/882	5	337	0/000
Employee	172	50/1	61	17/77				
Non-government	12	3/5	69	6/56				
Teacher	58	16/9	67	18/10				
Army	59	17/2	70/5	18/7				

Independent t-test results indicated that the patients who were the member of the Diabetes Association had limited health literacy. The P for health literacy was 0.004 in health literacy, 0.021 in reading comprehension, and 0.006 in numerical section (Table 10).

Table 10
Relationship of health literacy and its dimensions with Diabetes Association membership

	Membership			Non-membership			Mean difference	T	Df	Significance
	Number	Mean	Std deviation	Number	Mean	Std deviation				
Reading comprehension	95	33/81	-2/925	248	35/21	10/47	0/008	-2/310	341	0/021
Numerical ability	95	30/26	-3/450	248	32/66	10/01	2/048	-2/791	341	0/006
Health literacy	95	64/08	-6/376	248	67/87	18/01	0/897	-2/889	341	0/004

Table 11
Relationship of health literacy and its dimensions with educational resources

		Number	Mean	Mean difference	DF	F	T	Significance
Family members	Yes	70	68	-3/22	341	2/36	-1/303	0/043
	No	273	65					
Diabetes Association	Yes	47	67	-1/135	341	1/878	-0/391	0/426
	No	296	65					
Physician	Yes	252	66	-1/279	341	0/101	-0/565	0/050
	No	91	65					
Television	Yes	129	72	-9/461	341	6/215	4/732	0/000
	No	214	62					
Internet	Yes	26	74	-8/833	341	14/28	-2/358	0/176
	No	317	65					
Friends	Yes	50	70	-5/355	341	6/512	-1/900	0/025
	No	293	65					

		Number	Mean	Mean difference	DF	F	T	Significance
Personal studies	Yes	109	75	-14/302	341	28/366	-7/141	0/000
	No	234	61					
Radio	Yes	46	70	5/552	341	7/666	-1/903	0/032
	No	297	65					
Health centers	Yes	76	66	-1/201	340	3/877	-4/99	0/417
	No	266	65					

Table 12

Comparison of health literacy and its dimensions across demographic features

Variables	Functional health literacy						Health literacy level						P_v
	Reading comprehension		Numerical ability		Total		Adequate		Marginal		Inadequate		
	Mean	Std deviation	Mean	Std deviation	Mean	Std deviation	Number	Percent	Number	Percent	Number	Percent	
sex													
Female	8/33	3/10	2/30	5/10	64	4/18	76	8/35	53	25	83	2/39	010/0
Male	35	9/10	34	5/9	3/69	81/1	66	4/50	28	4/21	37	2/28	
Age													
29<	1/39	2/6	8/35	4/6	75	9/10	4	7/66	1	7/16	1	7/16	
30-39	1/28	6/7	5/35	8/8	7/73	9/14	22	9/57	10	3/26	6	8/15	
40-49	4/34	6/9	6/30	1/11	65	1/18	42	3/39	24	4/22	41	3/38	007/0
50-59	5/34	6/10	4/31	5/10	9/65	7/18	55	4/41	32	1/24	46	6/34	
60-69	9/31	4/12	7/31	1/9	7/63	5/19	17	7/34	12	5/24	20	8/40	
<70	27	4/14	2/29	9/9	2/56	2/21	2	20	2	20	6	60	
Education													
Reading & writing ability	2/26	3/9	9/2	7/5	1/47	2/9	0	0	0	0	10	100	
Elementary	3/26	10	4/24	3/10	8/50	4/16	4	6/5	16	5/22	51	8/71	
Secondary	1/33	3/10	7/30	9/9	9/63	7/17	24	8/33	22	31	25	2/35	
High school	8/35 2/39 4/43	6/9 3/5 5/5	8/33 2/35	8/8	7/69	9/15	57	5/50	27	3/24	28	2/25	000/0
Associate D.				8/8	5/74	1/12	19	3/54	13	1/37	3	6/8	
Bachelor's D			7/38	2/7	1/82	5/11	38	4/86	3	8/6	3	8/6	
Job													
Housewife	4/32	10	7/28	3/10	1/61	7/17	48	9/27	45	2/26	79	9/45	
Employee	1/36	7/10	7/34	2/9	9/70	3/18	31	5/52	14	7/23	14	7/23	
Non-government	34	7/10	33	2/10	67	1/18	26	8/44	11	19	21	2/36	
Teacher	1/41	3/6	9/35	9/7	77	2/12	29	69	10	8/23	3	1/7	000/0
Army	32	4/16	6/37	11	6/69	5/26	8	7/66	1	3/8	3	25	
Diabetes Association membership													
yes	2/32	5/10	2/29	8/10	4/61	19	30	6/31	20	1/21	45	4/47	004/0
No	2/35	4/10	6/32	10	8/67	18	112	2/45	61	6/24	75	2/30	

Discussion

The average of the health literacy level of diabetic patients referred to Shiraz health centers was 66, showing that the patients have marginal health literacy. Patients with marginal health literacy often have a wrong understanding of the information on medication boxes and have no comprehension about their rights and responsibilities (Chew, Bradley, & Boyko, 2004). Investigation of the diabetic patients' health literacy indicated that only 41% of them have adequate health literacy, and the rest have marginal or inadequate health literacy. The 2003 National Adult Literacy Survey reported that 36% of adults in the United States have inadequate health literacy (Han, Jiyun, Miyong, & Kim (2011). Tehrani Banihashemi and Reisi also reported the inadequate health literacy in Iran (Tehrani Banihashemi, Amirkhani, Haghdoost, Alavian, Asgharifard, Baradaran, et al. 2007; Reisi, Mostafavi, Hasanzadeh, & Sharifirad, 2011).

In Federman`s study, 36% of the participants with chronic asthma had in study had marginal or low health literacy (Ricardo, Yang, Lora, Gordon, Diamantidis, Ford, et al. 2014).

Studies have shown that low health has prejudicial effects on the patients' health such as lack of self-confidence, chronic diseases, more hospitalization and more cost. Low health literacy is a risky factor in elderly mortality, particularly because of cardiovascular diseases (Cho, Lee, Arozullah, & Crittenden, 2008). Patients do not understand the given information during the treatment and do not observe medical and preventive treatments, so impose more pressure to the health service providers.

Limited healthcare literacy is associated with increased complications resulting from chronic illnesses such as diabetes, heart disease/heart failure, asthma, hypertension, and HIV (Khosravi, Ahmadzade, Arastopoor, & Tahmasebi, 2013).

Health librarians as specialists in information acquisition have an important role in improving the consumer's healthcare. Hence, efforts to improve public health literacy are essential and require the cooperation between different sectors of the society.

Health libraries and health librarians in the era of change and technology ought to be creative and firm enough to ensure equal access to healthcare information aiming to enhance the clients' learning and decision making. Improving the physician-patient relationship skills in a manner that is understandable to both of them, increasing the learning skills in order to prepare simple and understandable resources for low health literacy patients and illustrated resources for illiterate patients by the health information providers, and preparing simple audio-visual materials are some steps to enhance the public health literacy. Health librarians, in addition to helping to identify individuals with low health literacy, can find and make use of other ways to tackle with health literacy issues (Baker, Wolf , Feinglass, Thompson, Gazmararian, Huang et al. 2007). For instance, they can influence healthcare literacy by shortening the communication gap between the public and the healthcare professionals. Medical librarians are skilled in applying criteria to information searches, choosing quality content and teaching the clients to assess healthcare information in terms of quality (Freitas, 2008). They support the consumers directly by producing easy to understand and culturally appropriate multilingual materials, especially for those in vulnerable populations (Glassman, 2008). By providing the users with "plain language" health information, librarians can further support information tailoring via health literacy (Glassman, 2008). Some other ways health librarians can use are sponsoring seminars and classes to teach the necessary skills of visual,

numerical, computer, and information literacy, and providing space for meetings (MacDonald, Winter & Luke, 2010).

Unless the people`s health literacy needs are met, attempts to reduce costs and inequalities in health services and increase the quality of care will not be fruitful (Kinding, Panzer, & Nielsen-Bohlman, 2004). There was a significant association between the participant's age and health literacy in the present study. Reading comprehension skill decreased with advancing age so that the health literacy declined in the older participants. The possible reason could be that the older patients were less educated. On the other hand, since the questionnaire is a multiple choice test and younger generations are more familiar with such tests, therefore, the health literacy level was lower in the older patients compared with the younger ones. The results of Reisi's study confirm this relationship; men had higher health literacy than women. This difference was more significant in numerical section. Other researchers have also reported such difference (Tehrani Banihashemi, Amirkhani, Haghdoost, Alavian, Asgharifard, Baradaran, et al. 2007; Kinding, Panzer, & Nielsen-Bohlman, 2004). But Klindle and Linstrom's study indicated that women have higher health literacy than men (Kinding, Panzer, & Nielsen-Bohlman, 2004; Reisi, Mostafavi, Hasanzadeh, & Sharifirad, 2011). This could be happened because of the tool used to measure health literacy in their study.

In our study, people with higher education level had higher level of health literacy. The reason is that public education is the foundation for health literacy. Other studies have also reached this conclusion (Sudore, Mehta, Simonsick, Harris, Newman, Satterfield, et al. 2006; Cho, Lee, Arozullah, & Crittenden, 2008; Lindstrom, 2008; Wolf, Gazmararian, & Baker, 2005; Tehrani Banihashemi, Amirkhani, Haghdoost, Alavian, Asgharifard, Baradaran, et al., 2007; Kinding, Panzer, & Nielsen-Bohlman, 2004).

In terms of employment, teachers had the highest health literacy and homemakers had the lowest. This can be the main reason the difference between health literacy level and gender. Membership in Diabetes Association was also supposed to be a factor in increasing health literacy, but the reverse result was observed. One reason is that the age of half of the patients who were the member of the Diabetes Association and completed the questionnaire was in the range of 50-60, and as mentioned before there was a reveres relationship between health literacy and age in the present study.

Conclusion

Health literacy is a concept that describes the ability of patients in understanding the information and resources provided by the physicians and health professionals (Cho, Lee, Arozullah, & Crittenden, 2008). This concept consists of a range of simple and complex skills, which allow people to participate in health decision making and protect themselves, their family and communities against diseases. Generally, health literacy is one way to improve health and enhance the quality of life. Patients are not interested anymore to merely take recommendation from their physician; they want to participate in all aspects of their healthcare including the decision making process through obtaining and analyzing often complex data and information. Health and medical librarians believe that knowledge is the *sine qua non* of informed decisions in health related aspects including care, education, and research. Health librarians serve the society and institutions by ensuring to make informed decisions (Charles, Gafni, & Whelan, 1997).

Health librarians can promote their role as information specialists through partnering with outreach programs to assist vulnerable populations, which can also make a significant economic and humanitarian impact. Librarians, collaborating with health professionals, are both provider of information and educator in the field of health care activities.

Librarians must have at hand or have access to the resources that are appropriate to the question and the literacy level of the information seeker. Quality should not be ignored as well; old, outdated or wrong medical information can be dangerous. What books, periodicals and databases must be available, in times of limited budgets and resources, is a difficult decision healthcare librarians may have to make. Hospital Librarians due to having knowledge and skills can work as health literacy educator in health centers and hospitals and play a big role in promoting health literacy in the community. Recommended that entered as one of the tasks of hospital librarians in their organizational position.

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