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The Relationship between Health Literacy and Knowledge in Rural Patients with Type 2 Diabetes Mellitus in 2016

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Abstract

Aim: Health literacy means having basic health information and services needed to make appropriate health decisions. The aim of this study was to assess the relationship between health literacy and knowledge in rural patients with type 2 diabetes mellitus.

Methods: This descriptive-analytic study was performed on 120 patients with type 2 diabetes patients in 2016 in two health homes of Hossein Abad and Kaghazi villages of Aran and Bidgol City in Isfahan Province. Sampling was done by census. Data were gathered by three questionnaires. They were valid and standard questionnaires including demographic, knowledge and HELIA. The data were analyzed by SPSS16 software using descriptive statistics, T-test, correlation coefficient and ANOVA.

Findings: In this study, the participants were 66.7% women, 29/2% worker, 5/8% employee, 4/2% retired, 5% unemployed, and the rest were housewives. The mean score of health literacy and knowledge was 13/82±2/20 and 114±23/21, respectively. The mean age of the participants was 48/88±9/57 years, the mean score of knowledge and health literacy of the participants was 13/82±2/20, 114±23/21, respectively. There was a significant relationship between health literacy and knowledge ($p=0.007$) and between health literacy and educational level ($p<0.05$). Also there was a significant difference in health literacy between men and women ($p=0.001$).

Conclusion: According to the results of the study on the relationship between health literacy and educational level, this study suggests that since the women have an axial role in family health, in order to improve the level of knowledge, the formal education level in rural women diabetic patients must be increased.

Keywords: Health Literacy, Knowledge, Diabetes Type 2

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Introduction

Today, increasing the burden of non-communicable diseases, including diabetes in the developing countries is a serious health threat. Life styles, lack of mobility and physical inactivity, and inappropriate nutrition patterns (foods rich in sugar and starch) increase the incidence of diabetes [1, 2]. Diabetes mellitus is an endocrine disease, and due to metabolic disorders, it is one of the main human health issues due to creating complications, increased costs of treatment and disability [3]. It causes 4 million deaths per year and 9% of all deaths in the world [4]. In Iran, there are about 3 to 4 million diabetic patients, and the prevalence of this disease in the population over 30 years has been reported to be 7.3% [5]. The study of Mansuri et al. in Kermanshah showed that the prevalence of diabetes in the urban and rural population was 2.9 and 1.2%, respectively [6]. The direct and indirect costs of diabetes and its complications are higher than those of other diseases [7]. It brings about heart, eye and kidney diseases, and is the common reason of many permanent amputations and disabilities [8]. The number diabetic people in the world are estimated to increase from 171 million in 2000 to 366 million in 2030 [9]. With the increasing number of diabetic patients worldwide, diabetes will continue to grow. Over the next 25 years, diabetes will become the leading cause of disability and death in the world [10]. One of the effective factors in the prevention and control of diabetes is having enough knowledge of the disease. One of the factors affecting the level of knowledge and controlling and effectively regulating diabetes is health literacy. Health literacy is a degree that people need to make the right decisions about their own health, and have the capacity and ability to earn, process, and understand health information and services [11]. In other words, health literacy is a set of reading, hearing, analysis and decision-making skills, and the ability to use these skills in health situations; it does not necessarily refer to years of study or general reading ability [12]. Today, health literacy is a vital indicator [13] as it increases the hospitalization and health care use [14]. One in three people with diabetes is estimated to have low levels of health literacy [15], which could include high health care costs. In 2008, the annual economic cost of the United States was estimated to be US $ 366 billion [16]. In type 2 diabetic patients, low health literacy is associated with a lack of knowledge and understanding of diabetes with consequences such as retinopathy. It is accompanied with weaker blood glucose control [15]. The study of Khosravi et al. showed that 22.8% of diabetic patients have enough health literacy and 39.2% of them had inadequate health literacy. It was found that

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men (73.6%) had a higher level of literacy than women (65.2%) [17]. The results of the latest national study in the United States, showed that 36% of adults had adequate health literacy [18]. In the study of Tehran et al, 28.1% of the people had enough health literacy, 15.3% had border health literacy and 56.6% had inadequate health literacy [19]. According to the study of Heidari et al., more than three quarters (79%) of the people were not aware of their diabetes and its complications; this lack of awareness can be effective in many areas including self-care and prevention of secondary acute complications of the disease [20]. Javadi et al. showed that 85.3% of the patients had poor knowledge, 14/2% had moderate knowledge, and 0.5% had a good knowledge of diabetes [21]. Also in the study of Rezaei et al. in Aligudarz, the level of knowledge about good illness was 3.3% [22]. In both studies, the level of knowledge is similar and a low percentage. Promoting knowledge of the disease, complications, treatment, and nutritional status are the main goals to care for diabetic patients [23].

Knowledge of patients leads to more responsible self-care [24]. Teaching a patient is an essential component of diabetes control [25], and educational interventions are designed to diabetic patients can make the patients aware of prevention, treatment and control of the disease [26]. In most of type 2 diabetic patients, correct education and knowledge, leads to change behavior and eventually, the disease is controlled without any additional treatment [27]. The effective role of education and knowledge on the attitude and function of patients has well been documented in a study conducted in Saudi Arabia [28]. Also at the University of Pretoria, after short training intervention, the patients' knowledge and attitudes improved [29]. Several studies have been conducted in the field of the effect of well-informed awareness on the consequences of diabetes, and there is no doubt that the consequences of diabetes are directly linked to diabetes control, which, in turn, can improve the health literacy index of patients [30]. Esfahrodi (2014) in Yazd showed that 83.3% of men and 16.7% of women were diabetic [31]. Also the study of Faramarzi et al. (2012) revealed that the prevalence of diabetes in the rural areas of Fars Province was 11.14%, which is higher than the average of the country [32]. The prevalence of diabetes is 6.8%, while several studies in different regions of Iran, including in Aran and Bidgol health network represent an upward trend. The prevalence of this disease in the two villages under study (Hussein Abad & Kaghazi) was 17.66% and 23.12%, respectively that is much higher than the expected level [33]. The aim of this study was to find out the relationship between health

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literacy and knowledge in rural patients with type 2 diabetes mellitus in 2016.

Materials and Methods

This descriptive-analytic study was performed on 120 patients with type 2 diabetes patients in 2016 in two health homes of Hossein Abad and Kaghazi villages of Aran and Bidgol City.

The total number of people with diabetes was 328 in the two villages. The study inclusion criteria were age between 18 and 65 years, having at least ability to read and write, and having the ability and willingness to participate in the study. The exclusion criteria were severe chronic diabetes complications (kidney, liver, vision and hearing disorders), and severe mental illnesses. Sampling was done by census. All diabetic patients with diabetes records who had the entry criteria were entered into the study in the two villages of Hossein Abad and Kaghazi.

Data collection tools in this study were three questionnaires: 1) Questionnaire on demographic characteristics including questions about gender, age, marital status, occupation, income, etc. 2) The questionnaire with eight questions related to nutrition knowledge including the number of meals, type of food and cooking food suitable for diabetics. Validity and reliability of this questionnaire were confirmed by Amini et al., where the correlation coefficient between the two-time responses was 84% [34]. 3) The HELIA questionnaire for measuring health literacy developed by Montazeri et al.

This tool has been designed to measure the health literacy of the population aged 18-65 years. The concepts of health literacy include accessing, reading, understanding, assessment and decision-making and deployment of health information. The reliability of the questionnaire was confirmed by Cronbach's alpha coefficient (72% to 89%).

This tool, while trying to cover various aspects of health literacy separately, is used for the measurement of the items using a simple language. The advantage of this tool is that it does not belong to the cortex, occupation, education, age group or any other specific area; rather it can be used for all different demographic groups. The questionnaire has 33 items in which a Likert scale of 5 options has been used [35]. After obtaining permission from the relevant authorities, based on the characteristics of the subjects and after introducing and explaining the study goals as well as ensuring about the confidentiality of their information, the questionnaires were distributed and the required data were collected. The collected data were analyzed using SPSS16 software, descriptive statistics (mean and standard deviation), t-test, correlation coefficient, and analysis of variance ANOVA.

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Findings

The number of participants in this study was 120, whose demographic characteristics are presented in Table 1.

Table 1: Demographic characteristics of patients with type 2 diabetes in two villages of Hussein Abad and Kaghazi of Aran and Bidgol in 2016

Variables	Number/Percent
Age(Average\ Standard deviation)	48.38±9.57
Gender	
Female	80(66/7%)
Male	40 (33.3 %)
Marital status Number (percent)	
Married	118 (98.3%)
widow	2 (1.7%)
Educational level	
Primary school	105 (87.5%)
Midel school	10 (8.3%)
High school	5 (4.2%)
Duration of infection(Average\ Standard deviation)	6.8±4.99
Average Income (Toman)	
Less than 1 million	92 (76.7)
1 to 2 million	28 (23.3%)

The highest percentage (75.8%) of the studied units was related to health and illness by asking a physician and healthcare staff; the rest of the people get information through the Internet, radio and television, friends and acquaintances.

According to the Kolmogorov-Smirnov's test, the distribution of data was not normal, so we used Spearman's correlation coefficient test. The results showed a significant relationship between health literacy and education level ($r=0.377$, $p<0/000$), and between health literacy and knowledge ($r=0.265$ and $p<0.003$).

Pearson's correlation coefficient results showed is a significant reverse relationship between health literacy and age ($r=-0.231$, $p<0.01$). On the other hand, there was no meaning relationship between health literacy and income.

Also Spearman's correlation coefficient test showed knowledge and education level, and Pearson's correlation coefficient test revealed no significant relationship between health literacy and income and age.

The results of comparing health literacy rates between men and women are presented in Table 2.

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Table 2: Comparison of the mean scores of health literacy and knowledge between women and men in two villages of Aran and Bidgol City in 2016

Variables	Number	Health Literacy (Standard deviation ± Averag)	Knowledge (Standard deviation ± Average)
Gender			
Female	80	109±22.4	13.9±2.05
Male	40	124±21.7	13.6±2.5
P-value		0.001	0.601

Independent t-test showed a significant difference between the mean score of health literacy in men and women; health literacy was higher in men than in women (Table 2).

One-way ANOVA test revealed a significant difference between the mean score of health literacy and education levels in the elementary groups with cycles ($p<0.02$) and diplomas ($p<0.01$). This difference was not observed between the cycle and diplomas the group. On the other hand, the mean scores of awareness among the groups with different levels of education were not significantly different (Table 3).

Table 3: The average literacy health and knowledge rate according to the level of education in two villages of Aran and Bidgol City in 2016

Variables	Elementary (Average\ Standard deviation)	Guidance (Average\ Standard deviation)	Diploma (Average\ Standard deviation)
Health literacy	111.2 ±21.22	131.1 ± 10.80	139.4 ±4.09
Knowledge	13.7 ± 2.62	14.64 ± 1.64	14.4 ± 1.67

Spearman's correlation coefficient showed that there was not a meaningful relation between duration of infection and health literacy and knowledge.

Pearson's correlation coefficient indicated a significant relationship between reading, understanding and behavior in health literacy and knowledge. However, other dimensions of health literacy and knowledge were not meaningful (Table 4).

Table 4: Relationship between dimensions of health literacy and knowledge in two villages of Aran and Bidgol City, 2016

Health Literacy	Knowledge	
	r	P-value
Health literacy dimensions		
Reading	0.205	0.025
Access	0.169	0.065
Understanding	0.237	0.009
Apprize	0.144	0.116
Behavior	0.199	0.02

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Discussion and conclusion

The aim of this study was to survey the relationship between health literacy and nutritional knowledge in rural patients with type 2 diabetes. The results a significant relationship between health literacy and knowledge score of diabetic patients. As people's health literacy increases, their knowledge of their illness increases, too; many studies emphasize and agree with this finding [36, 37]. The level of health literacy of type 2 diabetic patients was favorable, which is contradictory with most studies including Caroline et al. [38], McCleary [39], Bains SS and EgedeLE [40], Russel et al. [41] and Kandula [42]. Also the findings of this study showed a meaningful relationship between the dimensions of reading and understanding and behavior in health literacy, indicating the more knowledge about health makes the people stronger at reading and understanding of the health issues and adopting health behaviors. Sulemani's study showed that there is no relationship between the health literacy and the necessary knowledge about the prevention of complications of diabetes among diabetic people [43]. According to the findings of this study, there is a significant difference between the mean of health literacy and education levels in elementary groups with cycles and diplomas. This finding is consistent with the study of Hadi Kochiar et al. [44], and other studies [45-47]. High level of health literacy and knowledge in people with higher education level confirms the role of education in this issue, which is consistent with the results of the studies by Tehrani et al. [48], Bains SS and Egede LE [40], McCleary [39]. The results of this study revealed that diabetic patients receive more information through healthcare health workers and doctors, which is consistent with the findings of Montazeri et al. [49]. Therefore, it seems necessary that during clinical meeting, it is necessary that doctors fit their relationship with the patient based on the patient's real health literacy. Some simple methods for this purpose are the use of simple language, low speed, and the participation of important family members in the discussions [48, 50]. The US National Working Group on Literacy and Health recommends that health topics are written in the fifth grade, which is still hard for a quarter of the population [48, 50]. Non-printed media (non-written) are one of the effective ways to present a health message to people with a low level of literacy; these media may include images and video tapes, audio tapes, etc. [48]. There was a significant negative relationship between health literacy and age of patients. The results revealed that as the age increases, the level of health literacy decreases, which is consistent with the study of Tehrani Bani Hashemi [51]. By increasing the age of illness,

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the health literacy of patients decreases; one of the possible reasons for this can be a higher level of low literacy in previous generations. The results of this study revealed that the mean health literacy was significantly different in men and women (the mean health literacy in men is higher), which is consistent with the research by Reyes [52] and Lee et al. [53]. There is also a meaningful relationship between health literacy and gender. In the studies of Masoomeh Qaeda and et al. [54], this relationship holds true. Contrary to the present study, in research von Van et al., the level of health literacy was reported to be higher in women than in men [55]. The results of Bani Hashemi et al. [51] and Orlou et al. showed a lack of gender communication with a low level of health literacy among students [56]. In the study of Musher et al. [57], also there was no significant difference between health literacy and gender, may be due to the fact that men are more likely to have different levels of education than women, especially in rural communities, which is expected to lower the level of public knowledge of women than men. In the present study, there was no significant relationship between health literacy and knowledge and the duration of the disease; however, in the study of Azar Tal et al. [58], there was a reverse and significant relationship in this regard. This difference is likely to be related to the kind of community surveyed in both urban and rural studies, so that access limitations to education and training facilities by villagers are more than in city dwellers. This does not make any significant changes in their level of awareness and health literacy during the course of the disease.

Considering that the present study showed there is a significant relationship between health literacy and education, the level of health literacy is lower in women than in men, and since women play an important role in the health of the community and especially in the villages and as the axis of families, education investment in women is better they get all their knowledge and information from health homes through health care providers and doctors, and traditionally accept doctors as those who must act on their orders. It is suggested that this information be in line with the increasing their knowledge of health literacy (through holding nutritional training workshops for diabetics, along with other training sessions, including the use of educational media, including images and video tapes). Using effective communication strategies and helping healthcare professionals to plan and design useful health programs in this regard are effective in developing health literacy skills in the community. Also the results of this study showed that women's knowledge has been low. On the other hand, there is a relationship between the level of literacy and the level of

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education, and since women have a axis role in the family health, it is suggested to improve the level of knowledge and education in rural women diabetic patients. In addition, health professionals and health information providers must provide appropriate educational resources by recognizing their audience and their needs and capabilities [59].

Limitation of the present study

Considering that the research community was in the village and people did not have any literacy classes, so we divided the people into two groups (primary & cycle school). It is better that future studies be done on people with different levels of literacy.

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