

The Relationship Between Health Literacy and Health Promoting Behaviors in Patients with Type2 Diabetes

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Received: 17 July 2021

Accepted: 5 September 2021

Doi: 10.22038/jhl.2021.59721.1180

ABSTRACT

Background and Objective: Health literacy and health-promoting behaviors are the main factors in field of health promotion and education and play an important effect to prevent diabetes type II complications and reduce its health care costs. Therefore, this study aimed to find the relationship between health literacy and health-promoting behaviors in patients with type II diabetes.

Materials and Methods: This correlational study was conducted on 175 diabetic patients (20 to 65 years) from April 2020 to October 2020. Convenience sampling was used to select eligible diabetic patients who were referred to governmental diabetes clinics in Ganjavian Hospital where located in Dezful city, Iran. Data were collected by diabetic patients' health-promoting behaviors questionnaire and health literacy questionnaire. Data were analyzed using SPSS 22, descriptive statistics, and Pearson's correlation coefficient.

Results: The mean scores for health literacy and health-promoting behaviors were 113.54 ± 25.66 and 171.7 ± 33.69 , respectively. The highest scores in health-promoting behaviors belonged to blood sugar control and foot control and the lowest score belonged to physical activity. There was a significant relationship between all dimensions of health promoting behaviors and health literacy ($P = 0.000$, $r = 0.444$).

Conclusion: Since there is a positive relationship between health literacy and health-promoting behaviors, there is a need for more efforts in teaching health-promoting behaviors and publicizing self-care. Further, adding these concepts into course plans may lead to the health improvement of community members.

Paper Type: Research Article

Keywords: Health behaviors, Health literacy, Type II diabetes mellitus

► **Citation:** Mirsamiyazdi N, Jafari Pour F, Taqvaeinasab H, Masoudiyekta L, Amiri R, Azarbad S, Komeilifar Z. The Relationship Between Health Literacy and Health Promoting Behaviors in Patients with Type2 Diabetes. *Journal of Health Literacy*. Autumn 2021; 6(3): 24-31.

Introduction

Diabetes is a metabolic disorder has known as a serious challenge worldwide because of its frequency and the complications (1). According to the International Diabetes Federation (IDF), the number of diabetic patient was about 463 million in 2019, will be 578 million by 2030 if we do not take appropriate actions (2). Diabetes type 2 has been known as the most common type of diabetes, which can affect community health (3).

It has been predicted that the number of type 2 diabetic patients will be 552 million by 2030. Although, diabetes is incurable, it can be controlled (4). According to the WHO report in 2016, the prevalence of diabetes in Iran for people over 18 years old was 10.3%, which was accounted for 9.6% in men and 11.1% in women (5). About 80% of chronic diseases including diabetes can be controlled through changing lifestyle and following health-promoting behaviors which are the main factors to determine health and play a vital role in preventing and managing diseases (6, 7).

Health-promoting behaviors include several dimensions such as interpersonal relationships, health responsibility, spiritual growth, stress management, nutrition, and physical activity (8). Health literacy is a key element in health promotion and education (9). Health literacy has known as the capacity and ability to gain, process, and understand healthcare information for making adequate decisions about health. It consists of reading, listening, analysis, decision-making skills and how to use these kinds of skills in health positions. These skills are not necessarily related to education level or general reading ability (10). The relationship of Health literacy with health and quality of life in diabetic patients is completely clear (11).

Low level of health literacy is very common in type 2 diabetic patients (4). Studies have revealed that low health literacy significantly associated

with arbitrary and indiscriminate use of drugs, weaker self-management of diabetes, failure to follow the doctor's instructions, deteriorated blood sugar control, little health knowledge, weak relationship between patient and doctor, increased length of hospital stay, increased health care costs, poor health, and higher mortality rate than other people (12-14). Various studies have shown an extensive diversity of insufficient health literacy in different countries (15). According to a national survey conducted in the United States, the prevalence of insufficient literacy was reported around 48% (16).

The level of health literacy of diabetic patients is different in different parts of Iran (6). The results of some studies in Iran showed that most diabetic patients do not have sufficient health literacy (17, 18). However, in a study conducted in Tehran, the health literacy status of diabetic patients was optimal (19). Both health promoting behaviors and health literacy are key factors in promoting health and quality of life (20, 21).

The health literacy plays an important role in preventing the adverse effects of diabetes in patients and reducing health care costs. However, there is not enough evidence on the relationship between these two important factors in Iran. Given the importance of this subject, the current study aimed to examine the relationship between health literacy and health-promoting behaviors in patients with type II diabetes who was referred to diabetes clinic of Ganjavian hospital in Dezful city in 2020.

Materials and Methods

This correlational study was conducted on 175 diabetic patients (20 to 65 years) from April 2020 to October 2020. Convenience sampling was used to select eligible diabetic patients who were referred to governmental diabetes clinics in Ganjavian Hospital where located in

Dezful city, Iran.

The sample size was set to be 175 using the following formula and taking $\alpha = 0.01$, $\beta = 0.1$ and $r = 0.29$: (6).

$$n = \left[\frac{(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta})}{0.5 * \ln[(1+r)/(1-r)]} \right]^2 + 3$$

The eligible participants were selected simply because of its simplicity and availability. The inclusion criteria were: diagnosis and verification of type 2 diabetes by the specialist; suffering from the disease for at least 6 months; being able to read and write; being willing to participate in the study; and being free from mental and cognitive diseases.

In the case of incomplete completion of questionnaires, the samples were excluded from the study. After taking permission and achieving ethics code, the participants were informed about the purpose of the study and the confidentiality of their information, and they were asked to sign the written consent form.

In our study, the self-report method was used for data collection. We used three questionnaires to collect data. The first questionnaire was a demographic information questionnaire that contained 11 questions about age, gender, Level of education, family history of diabetes, monthly household income, and marital status.

The second questionnaire was a questionnaire for assessing diabetic patients' health-promoting behaviors. The Content Validity Ratio (CVR), Content Validity Index (CVI), and the total reliability for this tool was 0.62, 0.79 and 0.96, respectively. This questionnaire consists of 62 questions with 7 dimensions of spiritual growth (11 questions), responsibility for health (13 questions), Interpersonal relationships (8 questions), stress management (6 questions), physical activity (5 questions), nutrition (12 questions), and blood sugar control and foot

control (7 questions). Four-point Likert scale was used to assess the response to each question including a range of scores such as: Never = 0, Sometimes = 1, Often = 2, and Always = 3. The total score ranged between 0 and 138. Scores from 0 to 23 represent low level of behaviors; from 24 to 70 was moderate; from 71 to 116 was appropriate, and from 117 to 138 represent high level in health promoting behavior (6).

The third questionnaire was the questionnaire of health Literacy for Iranian Adults (HELIA). Its validity and reliability was examined by Cronbach's alpha 0.72 to 0.89. HELIA includes 33 questions assessing health literacy in five dimensions as follow reading (4 questions), accessing (6 questions), understanding (7 questions), evaluating (4 questions), decision-making and behavior (12 questions). For scoring this the questionnaire, a 5-point Likert scale was used. For reading dimension was scored through very difficult = 1, difficult = 2, not easy or not difficult = 3, Easy = 4, and very easy = 5. Dimensions of accessing, understanding, evaluating and decision-making and behavior were scored through not at all = 1, rarely = 2, sometimes = 3, most of the time = 4, and always = 5. The total range of scores in this questionnaire varied from 33 to 165. It can also be calculated separately for each dimension. The total scores of 0 to 50 indicate insufficient, 50.1 to 66 was semi-sufficient, 66.1 to 84 was sufficient, and scores of 84.1 to 100 represent excellent health literacy (22).

The collected data in this study were analyzed through SPSS 22 software, using descriptive statistics and Pearson's correlation coefficient. The descriptive statistics include relative frequency distribution, central indicators and dispersion. The mean value and SD were used to describe demographic variables, health promoting behaviors status and health literacy. Correlation test was used to determine the relationship

between health literacy and health promoting behaviors variables.

Ethical consideration

The Ethics Committee of Dezful University of Medical Sciences (IR.DUMS.REC.1398.002) confirmed this study. The researchers considered certain research ethics principles including respecting voluntary participation right, obtaining informed consent from the participants, and informing the participants of the purpose of the study.

Results

In this study, the average age of the participants was 52.53 ± 14.02 years. A total of 50.9% (89) participants were female and 49.1% (86) were male. In this study, 128 participants (73.1%) were married, 22 participants (12.6%) were widow, 18 participants (10.3%) were single, and 7 participants (4%) were divorced. Among all participants, 100 participants (57.1%) were under diploma education, 45 (25.7%) were diploma, 23 (13.1%) had bachelor's degree, and 7 (4%) had master's degree. Overall, 66 participants (37.7%) had no history of diabetes in your family and 109 participants (62.3%) had a family with history of diabetes (Table 1).

Table 1: The participants' demographic variables (N=175)

Demographic data		N (%)
Gender	Male	86 (50.9)
	Female	89 (49.1)
Marital status	Single	1 (10.3)
	Married	128 (73.1)
	Divorced	7 (4)
	Death of spouse	22 (12.6)
Education level	Under diploma	100 (57.1)
	Diploma	45 (25.7)
	Academic degree	30 (17.1)
Family with history of diabetes	Yes	109 (62.3)
	No	66 (37.7)

The mean score of health literacy was 113.54 ± 25.66 and it shows that more than 70% of the participants had adequate and excellent health literacy.

The mean score of health promoting behaviors was 171.7 ± 33.69 which 17 participants (9.7%) were poor, 104 participants (59.4%) were average, and 54 (30.9%) were good. The most common health promoting behaviors were blood sugar control and foot control, while physical activity has the lowest score of health promoting behavior (Table 2).

Table 2: Absolute frequency distribution and frequency percentage of health promoting behaviors in diabetic patients.

health-promoting behavior	Weak	medium	Good
Spiritual growth	23 (13.1)	95 (54.3)	57 (32.6)
Responsibility for health	21 (12)	87 (49.7)	67 (38.3)
Interpersonal relationships	17 (9.7)	90 (51.4)	68 (38.6)
stress management	41 (23.4)	105 (60)	29 (16.6)
Physical activity	83 (47.4)	66 (37.7)	26 (14.9)
Nutrition	9 (5.1)	80 (29.7)	86 (49.1)
Blood sugar control and foot care	18 (10.3)	52 (29.7)	105 (60)
Total	17 (9.7)	104 (59.4)	54 (30.9)

Health literacy and health promoting behaviors had a negative and significant relationship with age. Thus, as age increased, health literacy and health promoting behaviors decreased. Likewise, education was significantly associated with health-promoting behaviors. The education had also a significant relationship with health-promoting behaviors. The higher level of education was associated with the higher score of health promoting behaviors ($P = 0.000$). Table 3 presents the relationship between demographic variables and health literacy and health promoting behaviors.

Table 3. The relationship of health literacy and health promoting behaviors with demographic variables in diabetic patients

Demographic data	health promoting behaviors	health literacy
Age (year)	P = 0.035 (r = -0.159)	P = 0.000 (r = -0.447)
Gender	P = 0.869	P = 0.663
Education level	P = 0.000	P = 0.620
Family history of diabetes	P = 0.679	P = 0.063
Marital status	P = 0.811	P = 0.012
Disease duration (year)	P = 0.069 (r = -0.139)	P = 0.000 (r = -0.337)
Membership in the Diabetes Association	P = 0.252	P = 0.806

*Chi Square

Generally, there was a positive and significant relationship between the health literacy of diabetic patients and their health promoting behaviors (P = 0.000, r = 0.444). Also, other dimensions of health promoting behaviors had a positive and significant relationship with health literacy (Table 4).

Table 4- The relationship between dimensions of health promoting behaviors with health literacy

Dimensions of health promoting behaviors	Health literacy
Spiritual growth	p < 0.001 (r = 0.371)
Responsibility for health	p < 0.001 (r = 0.610)
Interpersonal relationships	p < 0.001 (r = 0.394)
stress management	p < 0.001 (r = 0.332)
Physical activity	p < 0.001 (r = 0.540)
Nutrition	p < 0.001 (r = 0.346)
Total	p < 0.001 (r = 0.444)

Pearson's correlation coefficient

Discussion

The purpose of this study is to investigate the relationship between the health literacy and health promoting behaviors in patients with type II diabetes who referred to diabetes clinic of Ganjavian hospital in Dezful city in 2020. This study showed that more than 70% of the participants

had sufficient and excellent health literacy, which is consistent with the results of the studies of SeyedoShohadaee et al (23), Myung Kyung Lee et al (24), castro et al. (25), and Javadzadeh et al. (26). However, some studies showed insufficient health literacy levels in diabetic patients (26, 27). It would be due to the difference in the factors affecting health literacy such as literacy skills, consciousness level, culture, experience, and have access to the general health systems. In this study, the average score of health promotion behaviors in diabetic patients was moderate, which is similar to the results of other studies (28, 29). However, the study on diabetic patients in Ahvaz reported that the appropriate level of health-promoting behaviors in patients with diabetes (6). This may be due to social, cultural, and geographical issues in different groups and races.

In the current study the most common health promoting behaviors were blood sugar control and foot control and the weakest health promoting behavior belonged to physical activity. In the studies conducted on patients with type II diabetes in Isfahan and Ahvaz (6, 7, 28), the weakest performance belonged to physical activity, which is consistent with the current study. This suggests that sedentary lifestyle is a common and serious problem among patients. Low motivation and inadequate knowledge about the benefits of regular physical activity is serious problem in-patient with type II diabetes to control their disease. Our findings are consistent with the study of wolf et al. (30) who indicated that most health-promoting behaviors were blood sugar control and foot control (6, 23). Regular blood sugar control is one of the dimensions of self-care that requires the availability of a glucometer or easy access to health care centers. This difference may be due to a variety of factors, such as differences in training programs

for diabetic patients, differences in patients' knowledge and attitudes, and differences in how patients measure their self-care (blood sugar monitoring). Likewise, it was evidenced that health care providers pay more attention to this behavior of patient, mainly in patients' education programs, which makes diabetic patients different in terms of self-care in different countries and even different regions of a country.

In the results of the current study, health literacy and health-promoting behaviors had a negative and significant relationship with age. Our finding showed that health literacy and health-promoting behaviors increased when age decreased which were consistent with the results of several studies (17, 24). These studies indicated that the individual's age affects the ability to read printed and electronic textbook. Therefore, it is necessary to use face-to-face oral teaching methods and alternative methods such as audio and image when providing education and information to diabetic patients because these types of methods could be useful for elderly who have less literate. Also, education had a significant relationship with health-promoting behaviors, so that person with high education showed the higher level of health-promoting behaviors, which is consistent with other studies of Taheri et al (17), Saber Gaffari-fam (31), Reisi et al (11) and Seyedoshohadaee et al (23).

In general, there was a positive and significant relationship between the health literacy of diabetic patients participating in the study and their health-promoting behaviors. Also, other dimensions of health-promoting behaviors were positively and significantly related to health literacy. Since health literacy is a key factor in improving people's health behaviors, it health promoting behaviors plays a very important role in preventing the early and late complications of the disease and increasing the life expectancy and

life quality. Therefore, the high level of health literacy lead to increase the health promotion behaviors dimensions in diabetic patients (such as spiritual growth, responsibility for health, interpersonal relationships, stress management, and physical activity). The results of the current study are consistent with the results of the study Eun Jung Bae et al (32), Abedi et al (29) and Barati. et al (33).

Limitations: In this study, one of the limitations was high number of questions in the questionnaire. Thus, participants were confronted by the measurements such as dedicate enough time to participants, answer their questions, consider a short break during interviews, and change the order of the questionnaire to be filled out. Since this study was done in a cross-sectional design, it may be the case that the results cannot be generalized to other province and ethnicities.

Conclusion: The current study shows that most participants have sufficient health literacy and health promoting behaviors. However, some participants have inadequate health literacy, which indicates the need for education in order to promote the level of health literacy and health promoting behaviors in the society. It also seems that there is a need for more efforts in teaching health promoting behaviors and publicizing self-care. Adding these concepts into course plans may lead to health improvement of community members.

Acknowledgement: The current article is based on the research approved by the Research Council of the Student Research Committee and the Medical Ethics Committee of Dezful University of Medical Sciences with the code of ethics IR.DUMS.REC.1398.002. The researchers thanked the Dezful University of Medical Sciences Vice Chancellor for Research and Technology for all their support and the Diabetes Center

officials for their cooperation in paving the way for this study and the diabetic patients who participated in the study.

Conflict of Interest: The authors declare that they have no conflict of interest.

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