

Analysis of the Effect of Training on the Health Literacy, Awareness and Behavior of Diabetic Type II Patients, Referring to the Clinics of Zahedan within 2014

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Abstract

The diabetic patients with low health literacy have more problems for understanding their disease and less participate in the self-care and blood sugar controlling activities. This study aims to determine the effect of training intervention on health literacy of diabetic type II patients referring to clinics (Imam Ali, Aliasghar and Khatam) of Zahedan. This study was a randomized controlled research that applied on 160 patients suffering from diabetes type II which classified in two intervention and control groups based on block random allocation. The data was collected by a valid questionnaire that before training was filled by two groups. The intervention group received a training session 45-60min as 8-person groups. 2 months (60 days) after training intervention, the both intervention and control groups filled the relative questionnaire again. SPSS v. 16 and statistical tests including independent t-test and chi square were used for analysis of data. No significance difference in awareness, behavior and health literacy was observed between two groups, before intervention; but, after intervention, mean values of awareness, behavior and health literacy in trained group was significantly higher than control group.

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In addition, after training the statistical test of independent t-test, significant difference was shown in change of skill score of accessibility to the information ($p=0.008$) and understandability of reading ($p<0.0001$) in the intervention group in comparison to control group. The results of this study indicated that even holding one training session for the diabetic patients may be followed by increment of health literacy 10%. Providing the training plan in simple language with high readability and accessibility to health information improves the health literacy, awareness and behavior of diabetic patients. And improve diabetic patients' health literacy leads to better results in the control and treatment of diabetes.

Keywords: Training; Health Literacy; Diabetes type II.

1. Introduction

Diabetes is the cause of mortality in many countries [1]. According to the report of International Diabetes Federation in 2014, about 387 million peoples suffer from diabetes throughout the world and it is predicted that it is reached to 592 million peoples until 2035. The diabetes resulted in 4.9 million mortalities in 2014 and every 7 seconds, one person dies from diabetes [2]. According to the newest statistics in 2013, statistics related to diabetic patients and mortality due to diabetes in Iran reported respectively 5214550 persons and about 38 thousand deaths [3]. Number of diabetic patients in Iran until 2030 will reach to more than 7 million peoples [4]. Diabetes imposes heavy costs to the health and treatment systems [5].

According to the report of International Diabetes Federation, world health costs for treatment and management of diabetes complications in 2013 is 548 billion Dollars at least and as predicted it may be reached to more than 627 billion USD until 2035 [6]. Training is one of the most essential prevention, treatment and control methods of chronic diseases such as diabetes [7]. One of factors affecting the control and prevention of diabetes is health literacy [8]. Non-observance of diabetes treatment in a few cases is dependent to the health literacy of people [9].

Health literacy means capacity of acquiring, processing and understanding the essential information and services required for appropriate decision making in the field of health [10] which includes a group of reading, listening, speaking, analysis, decision making and calculations skills and capability of applying these skills in the health situations [11]. The first survey study with the objective of analyzing the health literacy level in five state provinces (Tehran, Mazandaran, Booshehr, Kermanshah and Qazvin) indicated that the health literacy in Iran is low (28.1% adequate health literacy, 15.3% boundary health literacy and 56.6% inadequate health literacy) [12]. In the study applied by Mahmoudi and his colleagues health literacy level of diabetic patients was reported very low [13]. Low health literacy is associated with increment of mortality, hospitalization [14], and lower benefitting from preventive services [15]. The patients with low literacy have problem in understanding training contents, interpretation of nutrition information, identification of normal blood sugar and pressure range and interpretation of numbers [16] and less participate in the self-care and low blood sugar control activities [17].

According to the study applied by Haward, medical costs for people with inadequate health literacy are higher [18]. Improvement of health literacy may reduce the health cares costs and hospitalization period [19]. An

important instrument for improvement of health literacy is using simple language for perception of oral and written information [20]. The words that people use in the routine conversations, short sentences and images must be used for clearing the meaning of words for the patients with limited reading literacy [21]. Considering the highly importance of health literacy, this subject has not been studied in Iran, appropriately. The studies applied on health literacy of diabetic patients are very little. Diabetes is a complex disease that needs awareness and regular control of blood sugar by the patient himself. Improvement of health literacy may provide better results in the treatment and reduction of diabetes complications. Thus, applying further studies in this relation is necessary. The present study was applied with the objective of analyzing the effect of training on promotion of health literacy of diabetic type II patients in Zahedan, using health literacy questionnaire in order to achieve appropriate and effective solutions in this relation.

2. Materials and methods

The present research was a randomized controlled study that applied with the objective of determining the effect of training intervention on promotion of health literacy, awareness and behavior of patients suffering from diabetes type II. 160 patients referring to the clinics (Aliasghar, Imam Ali and Khatam) of Zahedan were placed in two control and intervention groups based on random allocation on block basis. After obtaining license from Ethics Committee of Research Deputy of University of Medical Sciences and permission of three hospitals (Imam Ali, Khatam, Aliasghar), the patients were included in the study.

Inclusion criteria were confirmation and diagnosis of diabetes type II by the specialist physician and passing more than one year after absolute diagnosis of disease, having good physical conditions and consciously satisfaction for participation in the study; and exclusion criteria included dissatisfaction of patients for participation in the study and lacking good physical conditions for responding the questions. In this study, a 4-part questionnaire was used; first part: related to individual characteristics of patients by asking 6 questions (age, gender, educations, employment status, family history of infecting with diabetes and its diagnosis years). Second part: health literacy questionnaire including four subparts of accessibility, information understandability, reading understanding, and calculation ability.

To design the questionnaire, functional health literacy in adults (TOFHLA) that is a valid questionnaire and translated in previous studies in Persian and its validity and reliability had been calculated, was used. Upon patterning the main framework of TOFHLA, a few changes were made in the information accessibility, information understanding, reading understanding and calculations. The questionnaire was localized to be more applied for the region and diabetic patients and its reliability and validity was obtained again. Health literacy questionnaire includes 36 questions. 10 questions about information accessibility, 10 questions related to information understandability, 11 questions related to calculation ability, 5 questions about reading understandability and total score of health literacy was obtained from total scores of four above parts. Total health literacy score is 75 and health literacy scores range is within 0-75.

Third part: researcher-made awareness questionnaire asking 14 questions and total score of awareness 34 and awareness scores range is within 0-34. Fourth part: the researcher made behavior questionnaire including 11

questions and total score of behavior 32 and behavior score range is within 0-32. To determine the validity of data collection instrument, content validity was used so that at first upon studying the valid books and papers related to diabetes type II, data was collected. Later, its content was studied and evaluated by 10 advisors, counseling advisors and diabetes therapists. After receiving their opinions and suggestions, required changes were applied on the questionnaire. To determine the reliability of questionnaire, test retest method and Cronbach's alpha test was used. In the retest method, the questionnaires were distributed among 20 persons of studied population, filled and collected, and again after 2 weeks, the same questionnaire were delivered to the same people and compared to each other in both turns. According to the summary of tests, Cronbach's alpha and correlation coefficient for health literacy ($r=0.8$ and $\alpha=0.88$), awareness ($r=79\%$ and $\alpha=78\%$), and behavior ($r=76\%$ and $\alpha=84\%$). The data was collected by interview and recording the information in questionnaire. At first, the questionnaire was studied and filled 2 months after training intervention by the participants in both studied groups. The control group received the routine cares and in the intervention group, a training program was implemented, including a training session as discussion in 8-member groups and questions and answers together with showing training film and PowerPoint. The sessions time was within 45-60min. in these sessions, the patients discussed about their disease using each other's personal experiences and in these training sessions, the trainer only acted as facilitator. At the end of training session, a training diabetes booklet was distributed among intervention group. The data was analyzed using SPSS v. 16 and descriptive statistical tests (frequency distribution, mean and standard deviation) and analytical tests including independent t test and chi square. The significance level in this study was assumed lower than 0.05.

3. Results

Altogether 160 patients suffering from diabetes type II participated in this study. Table (1) shows the demographic characteristics of patients in two groups. As it is observed, no significant difference existed between two groups in relation to the demographic variables before training intervention. In both groups, more than half of people (about 71%) consisted of women, almost 60% within age range 40-59 and family history of infecting with diabetes, over 80% of people, no longer than 4 years passed over diagnosis of their diabetes. Other demographic characteristics are shown in Table 1.

The mean and standard deviation of scores of health literacy skills in both intervention and control groups after implementation of training intervention are shown in table 2. Before intervention, no significant difference was observed between two groups, but after intervention, significant difference was observed between two groups in scores related to accessibility to information and reading understandability ($P<0.05$), so that after intervention, the mean information accessibility scores reached from 4.13 to 5.35 and reading understandability from 6.45 to 12.69 in the intervention group. According to table (2), after intervention, the mean of total scores of health literacy, awareness and behavior in intervention group was higher than control group and significant difference existed in the variations of total scores of health literacy ($P=0.002$), awareness ($P<0.0001$) and behavior ($P<0.0001$) between two intervention and control groups. According to the results, after intervention, mean of total scores of health literacy reached from 44.12 to 51.95, awareness from 22.3 to 31.92 and behavior from 19.79 to 27.59. Summary of results indicates that the training program including use of easy and understandable texts with readability for low literate patients was effective in intervention group.

Table 1: Comparison of demographic variables before the intervention and control groups, educational programs

variable		Groups		Groups control		Sig
		number	percent	number	percent	
gender	Man	23	28/4	20	25/3	P= 0/661
	Female	58	71/6	59	74/7	
Age groups	Less than 39	6	7/4	10	12/7	P= 0/534
	years59-40	51	63	46	58/2	
	years60 years	24	29/6	23	29/1	
Level of education	Illiterate	30	37	27	34/2	P= 0/989
	Primary	27	33/4	28	35/4	
	Diploma or higher	24	29/6	24	30/4	
Employment status	Unemployed	9	11/1	6	7/6	P= 0/193
	Working	2	2/5	5	6/3	
	Employee	3	3/7	1	1/3	
	Self-employment (private)housewife	4	4/9	0	0	
	Retired	50	61/7	50	63/3	
		13	16	17	21/5	
Years of diabetes diagnosis	Less than 3 years	15	18/5	14	17/7	P= 0/308
	9-4 years	29	35/8	27	34/2	
	14-10 years	23	28/4	31	39/2	
	More than 15 years	14	17/3	7	8/9	
A family history of diabetes	Yes	49	60/5	46	58/2	P= 0/77
	no	32	39/5	33	41/8	

Table 2: comparison of changes in mean scores of health literacy skills, knowledge and behavior before and after intervention .

construct	Group	Total score	Score before intervention	Score After intervention	Difference (After-before)	P value*
			Mean(SD) **	Mean(SD)	Mean(SD)	
The ability to access information	Intervention	10	4/13±2/09	5/35±2/06	2/22±2/28	0/008
	Control	10	4/62±1/96	4/72±1/9	0/1±2/37	
The ability to understand the information	Intervention	30	21/9±4/44	22/59±4/35	0/69 ± 6/11	0/515
	Control	30	22/07±4/71	22/17±4/38	0/1 ± 5/27	
Ability to understand reading	Intervention	16	6/45±3/96	12/69±3/62	6/23 ± 5/75	<0/0001
	Control	16	6/26±4/37	6/29±2/4	0/02 ± 5/23	
The ability to perform numeracy	Intervention	19	11/62±4/48	12/12±4/47	0/49 ± 6/73	0/613
	Control	19	10/46±4/71	10/49±4/05	0/02 ± 4/76	
health literacy	Intervention	75	44/12±12/48	51/95±11/42	7/82 ± 17/51	0/002
	Control	75	43/53±12/57	43/77±11/19	0/05 ± 14/12	
knowledge	Intervention	34	22/3(4/23)	31/92(2/22)	9/61 (4/72)	<0/0001
	Control	34	22/21(4/58)	22/44(4/07)	0/22 (6/32)	
Behavior	Intervention	32	19/79 (3/53)	27/59 (3/27)	7/8 (4/83)	<0/0001
	Control	32	19/5 (3/75)	19/78 (3/78)	0/27 (5/42)	

4. Discussion

This study was applied aiming to analyze the effect of health literacy, awareness and behavior of diabetic type II patients. Results of present study indicated a significant difference between score of health literacy, awareness and behavior in intervention group before and after training. This increment of scores related to health literacy, awareness and behavior of diabetic patients in intervention group indicates the positive effect of training and applied methods (use of training materials in simple language with the readability and understandability of patients etc.). Corresponding to the results of present study, the study applied by Tal and his colleagues with the objective of assessment of the effect of training program in small groups, on the awareness and literacy of female diabetic type II patients [8] and study of Mamiyanlou and his colleagues titled “analysis of the effect of training technique in small groups on the awareness and health literacy of cardiac patients [22] indicated that health literacy and awareness of patients was increased after holding training sessions. Study of Kavanaf [23] and Kandola [24] also showed that upon holding the training session, health literacy of patients is promoted. Systematic analysis by Van Scoyoc and Dewalt also confirms that training interventions may result in the improvement of better results for the patients suffering from diabetes with low literacy [25]. Assessment of

relationship between functional health literacy and awareness of patients suffering from hypertension and diabetes by Mark Williams and his colleagues demonstrated that 92% of patients suffering from hypertension with adequate health literacy could read the hypertension symptoms and 94% of patients suffering from diabetes with the adequate functional health literacy could read the hypoglycemia symptoms [26].

In addition, this study indicated that training intervention increases information accessibility in diabetic type II patients in the intervention group that is somehow similar to the study of Girber. Girber analyzed the information accessibility about diabetes via computer and summary of his study indicated the increase of sensitivity of intervention group to the diabetes complications and the time spent for use of computer was higher in the people with adequate health literacy [27].

According to the results of present study, reading understandability skill in intervention group was increased after training that may be due to using training diabetes booklet in simple language with the patients' readability and understandability. No study indicating the increase of readability due to training intervention, was found, but similar studies such as assessment of readability of references trained to the patient about diabetes by Khadijeh Ahmadzadeh and his colleagues indicated that readability of readability of training references is low and proportional to the people with academic literacy [28].

Summary of study provided by Eltorai also showed that the readability level of most training materials to the patient, available on the American Association for Surgery of Trauma Website (AAST) is higher than patients' understandability and readability [29]. Wallace & Lennon indicated that the readability of training references is low and most people are not able to understand them [30]. In another study applied by Esterda and his colleagues readability of training materials written for the patients, was assessed using 50 brochures and results of their study indicated that 88% of training materials have been written for the level of ninth grade and higher [31].

The findings of present study also indicated that the training increased the awareness of intervention group in comparison to control group. According to the results of independent t test, variations of mean of both groups was significant ($P < 0.0001$). In other similar studies such as study of Tal and his colleagues [8], Najmeh Almolouk Amini [32], Sadeghi [33], Rakhshandehro and his colleagues [34], Baghianimoghadam [35], Bayat and his colleagues [36], Malek [37], the people had good awareness after training.

Results of present study also indicated the effect of training on the behavior of diabetic type II patients, so that after training, the behavior score in intervention group was increased 7.8 score. The study provided by Mehdi Mameneh showed that nutritional behavior of patients trained based on participatory care model, was improved than before intervention [38]. In the study of Najmeh Almolouk Amini, after implementation of training program, the nutritional behavior of patients was increased significantly [32]. In the study of Ashvandi and his colleagues also the effect of self-care training based on Teach Back method increased the awareness and self-care behaviors of diabetic type II patients [39]. Summary of study applied by Ishikawa indicated that self-efficiency of patients with low communication literacy was increased when they participated actively in the patient-physician communication [40].

Altogether, results of study showed that training program, use of texts in simple language with readability for the low literate patients promote the health literacy, awareness and behavior of diabetic patients and can create significant changes in the health literacy, awareness and behavior of diabetic type II patients.

5. Conclusion

Significant changes in the awareness, health literacy and behavior of studied patients in this research demonstrated that even holding a training session for diabetic patients (use of training materials in simple language and understandable for the patients) may promote the health literacy, awareness and behavior of diabetic type II patients. Whereas most diabetic patients have very low literacy, the training material to the patient must be written in simple and understandable language for the low literate patients and those having no academic education. Presenting the training program in simple language with high readability and accessibility to health information improve the health literacy of diabetic patients and improvement of health literacy of diabetic patients provides better results for control and treatment of diabetes. This method together with produced training content may be used for all diabetic patients.

The limitations of this study included low education level and vision problems of studied people. The patients due to low literacy and ocular complications of diabetes were not able to fill the questionnaires. To solve this problem, the questionnaires were filled by the questioner via direct interview, and another limitation was non-willing of patients for presence at the training program due to lack of ability to pay the traffic costs and far distance of living area to diabetes clinic. This problem was solved by paying the traffic cost by the researcher.

Appreciation

This paper is a part of research project of M.Sc. thesis on Health Training and Promotion. Hereby, the researchers appreciate the honorable professors, research deputy of University of Medical Sciences of Zahedan and affiliated hospitals of university due to granting permission for applying this study, as well as the honorable patients due to participation in this study.

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