

## Effectiveness of the Designed Structured Education in Control of Type 2 Diabetes in Patients Referring to Firouzgar Endocrine Institute in 2007-2008, Iran

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**Abstract:** Diabetes mellitus is the main problem of health due to several complications and high cost, that the most effective person in control of disease is the patient. This search performed for design of structural education and its effect in control of diabetic type 2 patients. A semi-experimental search performed in the diabetic type 2 patients referring to Firouzgar endocrine institute (under license of Iran University of Medical Science) in 2007-2008. 91 patients selected by random sampling method, educated by lecture and "question and answer" Data collected by check list, questionnaire, FBS and HbA1c, before and 3 months after education, then analyzed. After intervention, mean of knowledge, attitude and practice increased and mean of HbA1C decreased ( $P < 0.05$ ), a significant relationship between practice and "BMI and duration of disease" ( $p < 0.05$ ), a direct relationship between knowledge and attitude, an indirect relationship between "practice and FBS" and "attitude and HbA1c" ( $p < 0.05$ ). Structural education promoted knowledge, attitude and practice, decreased FBS and HbA<sub>1c</sub>, so promoted control of type 2 diabetes in researched patients.

**Key words:** Structural education • Diabetes type 2 • Knowledge • Attitude • Practice

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### INTRODUCTION

For centuries diabetes has attracted the attention of doctors, scientists and research communities [1]. Diabetes is one of the major health problems in the contemporary world and it is rapidly on the rise [2]. Great changes in people's life styles with the growth of industrialization both have played their roles in the spread of diabetes type 2. While the number of diabetic in 1985 reached 30 million, only ten years later this number rose up to 140 million. The prediction for the year 2025 is even grimmer; an alarming rate of 330 million people will be suffering from the disorder [1].

Taking in to consideration the chronic and dire complications of the disorder, which would lead to blindness, acute kidney malfunction, heart attack and

stroke, limb amputation and death (4 million deaths a year and a death fiber for 9% of all of the deaths in the world) [3]. It seems quiet obvious that if appropriate quick preventive measures are not taken and treatment, is not done in due time this increasing population at risk would have to face limitations and multiple problems. Direct costs (2.5% to 15% of the hole health budget) [3], indirect costs leads, unpredicted insurmountable costs of diabetes and their effects are incomparable to other health problems, therefore prevention and control of diabetes should be one of major goals in the treatment of diabetes. Future reduction of diabetes costs would only become possible through promoting the level of care and treatment, with education playing a significant part because the patient himself is the most important part of the treatment [4].

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Diabetes type 2 is directly related to overweight ness, sedentary life style and diet, thus, in controlling the problem nation wide, people life habits must be changed with education [5, 6].

Education of diabetics leads to empowering the patients with three factors i.e. knowledge, behavioral skills and responsibility on the part of patient [7].

Diabetes type 2 because of its high prevalence, non apparent signs in the early stages and available effective preventive measures should be put on the first priority list of health education policies [8].

One of the health education models involves designing program oriented health education with the help of health experts in an organization for a target population for specific period of time that could be repeated and evaluated [7, 9].

The aim of this study was to determine the effectiveness of program oriented education in controlling type 2 diabetic referral patients to Firouzgar endocrine institute in 1386 (2008). The results of study were used to design a program oriented health education for type 2 diabetic patients.

## **MATERIALS AND METHODS**

In this semi experimental study conducted in 2008-9 91 diabetic type 2 referral patients to the institute were selected with random sampling method over a two month period during sixteen days.

The subjects were selected with the sample volume of 80% and study potential of 95% and probability of 20% drop in the sample population, 91 patients were studied. The entry condition to the study included: 30-70 years.

For the diagnostic procedures type 2 diabetes age group having at least 5<sup>th</sup> grade education was considered and those with following conditions were excluded from the program: over weights with 40 BMI pregnant women, patients with severe diabetes complication, hypertension and angina pectoris and other uncontrolled metabolic and gland complications. After selecting the patients they were well informed of the goals of the study and their consent was acquired to secure the confidentiality of the information.

The project approved in the ethic committee in health school (IUMS) and the samples completed informed consent too.

Data collection instrument included check list and researcher's structured questionnaire comprised of demographic information, knowledge, attitude, performance based questions and clinical tests involving FBS and HbA<sub>1</sub>C.

The questionnaire components were: Questions concerning attitude, (17Q total score 0-44) Attitude questions (17Q total score 0-34) performance questions (3Q score 0-7) and the check list included 21 behavioral questions.

In order to determine the face validity of the questionnaire, content validity model was used, that is, utilizing articles, text and other sources to construct the questionnaire. First a rough draft of a questionnaire was constructed and then to verify its reliability, test-retest model was used, in a way that 10 individuals completed the questionnaire for the second time after the first attempt in a week for attitude and knowledge questions, Pearson's coefficient correlation of. 80.1 and. 82 were respectively found.

Data were gathered by checklist, questionnaire and clinical tests) HbA<sub>1</sub>C, FBS) before and 3 months after the course of education. Lecture based and question answer sessions were conducted for a one hour session by diabetes nurse, nutrition expert working at endocrine institute.

The content of the program included: Definition of diabetes and its types, reasons and risk factors, early and latent signs, preventive and controlling measures, regulating and controlling blood sugar, foot care weight and hypertension control, diet and exercise guidelines, medication and quitting smoking. Three months after patients were invited back to fill out the instruction the check list and give clinical tests. Ultimately the data were analyzed and interpreted descriptively and statistically with the aid of SPSS software version 13.

## **RESULTS**

Results showed that the age range of subjects was between 30-70with an average 52 years old. The majority of patients under study (34.1%) were in 50-59 age range, most of them women (74.1%) and the majority were house wives (58.2%). 62.6% have 3-5 children and all the patients were city dwellers. Most of the patient's having the disorder, (63.1%) are between (0-10) years with a formal education under high school diploma (57.1%). Family trace of the disorder in most patients (11.9%) existed. The majority of patients under study used oral medication (70.3%). Most of their BMI'S (41.6%) was in the normal range 25-29 and blood pressure of 134.89 was taken from 70% of the patients which is in the normal range.

Most of the patients were using oral medication knowledgably, with good attitude and performance before and after the intervention.

Table 1: Comparison patients' knowledge, attitude, practice and HbA1C before and after structural education

Variable	Before Education	After Education	P. Value
	Mean + SD	Mean + SD	
knowledge	34.39 + 5.34	38.21 + 4.18	.025
attitude	21.5 + 4.49	23.6 + 5.07	.014
practice	3.30 + 2.53	5 + 2.06	.0001
HbA1C	2.12 + 7.07	5.24 + .69	.0001

Differences between means before and after education based on Paired t-Test were significant (P<.05)

Table 2: mparison Categories of in patients' knowledge, attitude, practice and HbA1C before and after structural education

Variable	Category	Before Education		After Education		K <sup>2</sup> Test P. Value
		Number	Percent	Number	Percent	
knowledge	High(40-44)	9	13.6	28	42.1	.0001
	Moderate(30-39)	45	68.1	36	54.5	
	Low(<30)	12	18.1	2	3.03	
attitude	High(30-34)	1	1.51	9	13.63	.023
	Moderate(20-29)	45	68.18	43	65.15	
	Low(<20)	20	30.3	14	21.31	
practice	High(6-7)	22	33.33	33	50	.011
	Moderate(4-5)	8	12.12	15	22.72	
	Low(<4)	36	54.54	18	27.27	

The correlations between knowledge, attitude, behavior and HbA1C Categories before and after structural education were significant based on K<sup>2</sup> Test (p<.05)

A comparison in the mean score of knowledge before and after the intervention showed a statistical significance (p = 0.025) and the mean score for knowledge rose from (34.39 to 38.21).The comparison between attitude scores before and after the intervention showed a statistical significance (p = 0.014) and the mean score of attitude rose from 2.5 to 23.6 after intervention (Table 1).

Pearson's correlation of r = 0.35 with p = 0.003 was found between knowledge and attitude after the education. A comparison between patients' mean performance score before and after the intervention a statistical significance was observed, (p = 0.025) and the mean for performance rose from 3.3 to 5. A comparison of patient's HbA<sub>1</sub>C before and after the instruction showed a statistical significance (p = 0.0001) and the mean for patients' HbA<sub>1</sub>C, C dropped from 7.07 to 5.24 (Table 2). K<sup>2</sup> tests showed a correlation between knowledge, attitude and performance of the patients before and after the intervention. (p = 0.0001, p = 0.023, p = 0.011) respectively.

A statistical significance between performance and duration of the illness and BMI of the patients (p = 0.026, p = 0.016 respectively) were found to exist. Pearson's

coefficient to (-0.26) was found between patients performance and FBS after the intervention (p = 0.032), also Pearson's coefficient of (-0.25) was found between patients' attitude and HbA<sub>1</sub>C, after the intervention (p = 0.037).

## DISCUSSION

The results showed that a structured designed of instruction improved the knowledge and the attitude of patients and promoted their performance. The same results were obtained in Aghamollaii *et al.*, study in 2005 [10] and also in a semi experimental study of Haidari and *et al.*, in 2001 [11].

In the current study HbA<sub>1</sub>C, mean dropped 1.8%, therefore the given instruction and education was effective in reducing the micro secular complications and control of the disorder.

In Aghamollaii [10] and *et al.*, and in Baghiyani (2001) [12,13] also, education resulted in the significant reduction of HbA<sub>1</sub>C, mean in patients. In this study a positive correlation was seen between knowledge and attitude after the instruction.

The result of the study showed a correlation between attitude, knowledge and the performance of patients before and after the intervention, in a way that favorable knowledge, attitude and performance showed an increase of 30%, 12%, 17% respectively. In Nazarian (2002) [14] and Agha mohammad Hosaini (2006) [15] and in Shabbidar *et al.*, in 2008 study [16], the knowledge, attitude and level of performance improved. The results of this study did not show a statistical significance between knowledge, attitude and patients' performance with demographic variables before and after the instruction, but after instruction there was a statistical significance between performance and two BMI demographic variables and the bout of illness, in a way that training and education had an effect on the performance of those patient's whose BMI in normal range (25-29.9) and the length of illness was between zero to ten years(9,10).

In Nazarian (2001) no statistical significant correlation was found between knowledge and attitude with demographic variables [14]. The result of this study showed a reverse correlation between performance with FBS and HOPAIC which means improved performance resulted in the patients' FBS and improved attitude resulted in the reduction of HbA<sub>1c</sub>.

Also exact observation of Fisher's test dedicated that in the scope of knowledge questions in the recognition of the disorder, its reasons, methods of diagnosis and treatment, diabetic foot complications and number of meals needed for this illness, knowledge and understanding was increased after the course.

The results also showed that in the area of other questions involved more efforts and studies needed to be done. Using the above test showed that there was a positive improvement in attitude regarding: control ability of the disorder, capability of each patient in controlling his/her illness, the effect of controlling blood sugar in controlling the disorder and its negative complications if not observed. In other words the patients self confidence in their ability to fight and control the disorder was improved. But in other attitude related questions more studies needed to improve the attitude. The performance is improved provided that patients follow, regular exercise program and watch strict diet all the time, but in the blood sugar tests, no consistent improvement in performance was observed and more education and work need to be done.

In Shabbidar and *et al.*, (2008) at Tehran University education in most of self cared questions regarding food and exercise was effective [16].

Fisher's test check list questions showed an improvement in performance if diet was strictly followed under the supervision of nutrition experts, if intake of starchy food and sweets were limited. Weight was controlled blood sugar level was reduced and physical activity was done regularly and doctor's, nurses and nutrition experts' orders were exactly followed, we would certainly observe improvement in controlling the disorder.

Ultimately this study showed that structured educational program in controlling diabetes type 2 led to the improvement in attitude, knowledge and performance of patients and their absenteeism became under control. The results were reported to Pasteur institute to be recommended after a 12 months trial period.

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