

## Evaluation of Knowledge and Practice of Patients with Type 2 Diabetes in Tehran University Medical Sciences Hospitals-2016

Mohammad Zoka Asadi<sup>1</sup>, Alireza Esteghamati<sup>2\*</sup>, Manouchehr Nakhjavani<sup>3</sup>

1. Endocrinology and Metabolism Research Center (EMRC), Vali-Asr Hospital, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.
2. Professor, Endocrinology and Metabolism Research Center (EMRC), Vali-Asr Hospital, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.
3. Professor, Endocrinology and Metabolism Research Center (EMRC), Vali-Asr Hospital, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.

### \*Correspondence:

Alireza Esteghamati, Professor, Endocrinology and Metabolism Research Center (EMRC), Vali-Asr Hospital, School of Medicine, Tehran University of Medical Sciences, PO Box 13145-784, Tehran, Iran.  
**Tel:** (98) 216 694 8671  
**Email:** Esteghamati@tums.ac.ir

**Received:** 27 October 2017

**Accepted:** 01 December 2017

**Published in December 2017**

### Abstract

**Objective:** Diabetes mellitus is a chronic condition becoming a worldwide health problem as a result of sedentary life style, obesity and some other risk factors. It is hypothesized that one of the barriers to achieve a proper control in diabetic patients is lack of sufficient knowledge about their disease. In this study we evaluated the knowledge and practice of patients with type 2 diabetes.

**Materials and Methods:** From February 2015 to August 2016, two hundred and thirty five patients with type 2 diabetes were included in a cross-sectional study and their knowledge and practice were assessed using a questionnaire validated in Iran. All samples were interviewed exclusively by one physician. Data extracted from the questionnaires were analyzed and compared to their mean HbA1c, blood pressure and lipid profile. The scores were also analyzed in different subgroups.

**Results:** The mean age of patients was 56.34; mean total score of patients was 13.34 out of possible 26 in which 5.24 (out of 11) were knowledge scores and 8.10 (out of 15) were practice scores. Knowledge score was significantly higher in women and highly educated people; but there were no significant relationships between score and duration of diabetes, mean HbA1c, blood pressure and lipid profile.

**Conclusion:** Most of patients with type 2 diabetes did not have an adequate level of knowledge about the disease. Their practice seems to have lacks in some aspects as well. Therefore actions should be taken to rectify these deficits and decrease the disease complications.

**Keywords:** Type 2 diabetes mellitus, Health knowledge, Attitudes, Practice

### Introduction

Diabetes mellitus is becoming a worldwide health problem as a result of sedentary lifestyle and obesity epidemic with an increasing prevalence during last decades. Diabetic micro and macro vascular complications are widespread in both developing and developed countries (1). In 2000 there were approximately 171 million

diabetic patients around the world and it is estimated to be 334 million by 2025 which is almost double (2). Based on recent studies the prevalence of diabetes in Iran has become higher than anticipated rising to 11.4% in Iranian adults between 25 and 70 years. This increase is approximately one million newly diagnosed Iranian diabetics during a 7-year

period. Additionally 14.6% of Iranian subjects had an impaired fasting glucose which means a larger population susceptible to developing overt diabetes in the upcoming years (3). These increases in prevalence will inevitably lead to rise in diabetes complications. Patients' Lack of sufficient knowledge about the disease and its complications is probably one of the barriers to manage an appropriate glycemic control and therefore lower the complications (4) (5)

Current studies revealed low level of knowledge among diabetic patients about the nature of their disease and its complications (4-7). A few studies are conducted about Iranian diabetic patients' perception of diabetes and how they practice in order to prevent macro- and micro-vascular complications such as the study of Khamseh ME et al study which showed Iranian patients with type 2 diabetes were not aware of diabetic foot ulcer (4). As well as Niroomand M et al study which has revealed good knowledge, attitude and practice of 61.41%, 50.44% and 52.23%, respectively for hospitalized patients (8). This study was designed and performed to evaluate knowledge and practice of Iranian patients about diabetes and diabetic complications specifically focusing on diabetic foot ulcer.

## Materials and Methods

From February 2015 to August 2016, two hundred and thirty five patients from one of Tehran University affiliated hospital and two private clinics were included in our study. All were older than 24 years who had checked their HbA1c at least two times during the last year. Exclusion criterion was gestational or type 1 diabetes mellitus. A questionnaire was designed to evaluate knowledge and practice of patients about their disease and the complications (focusing on diabetic foot ulcer). The questionnaires were validated by two endocrinologists and consisted of 26 questions which 11 items were about knowledge and 15 items about practice. Moreover the questionnaire was firstly

underwent test and re-test in 15 patients. Finally, internal consistency was evaluated by means of Cronbach's alpha (0.73). All questions were multiple choice and no open questions were asked. Higher scores for patients show higher knowledge and better practice. Informed consent was obtained from all patients to participate in the study and the study protocol was confirmed by the ethical committee of Tehran University of Medical Sciences. To reduce biases all patients were interviewed by exclusively one physician. Scores of patients (in both knowledge and practice fields) were extracted from questionnaires. Diabetic control was determined by means of HbA1c, blood pressure and lipid profile during the last year and then was compared with scores extracted from questionnaires. Moreover, total scores (and also knowledge and practice scores) were compared to duration of the disease, level of education and gender of patients. SPSS software, version 21, was used to analyze the data (IBM Corp. Released 2012. IBM SPSS statistics for windows, version 21.0. Armonk, NY: IBM Corp). Independent sample T-test, one way ANOVA and bivariate correlation tests were used and  $P$ -value<0.05 was considered significant.

## Results

Two hundred and thirty five patients were involved (M/F: 102/133). Mean ( $\pm$ standard deviation) age was  $56.34 \pm 12.16$  years. Mean ( $\pm$ SD) duration of disease was  $10.06 \pm 8.20$  years. Mean ( $\pm$ SD) BMI was  $28.83 \pm 4.92$ . Basic characteristics of studied patients are summarized in table 1.

There was no history of amputation among the patients.

Means of total, knowledge and practice scores were 13.34 ( $\pm 4.12$ ), 5.24 ( $\pm 2.08$ ) and 8.10 ( $\pm 2.61$ ) respectively. Mean HbA1c was 7.93 % ( $\pm 1.44$ )

Mean total and knowledge scores were significantly higher among women which reflects higher knowledge and better practice, with total and knowledge scores of  $13.95 \pm 4.27$

**Table 1. Basic characteristics of studied patients**

Variable	Frequency
<b>Age</b>	
≤60	61.70% (N=145)
>60	38.30% (N=90)
<b>BMI</b>	
≥30 (obesity)	34.04% (N=80)
<30	65.96% (N=155)
<b>Treatment</b>	
Oral agent	44.26% (N=104)
Insulin	11.91% (N=28)
Combination	43.83% (N=103)
Hypertension (>140/90mmHg)	48.09% (N=113)
Dyslipidemia	61.70% (N=145)
History of diabetic foot ulcer	6.38% (N=15)
Smoking	5.95% (N=14)
<b>Education</b>	
Illiterate	7.66% (N=18)
Primary school	34.47% (N=81)
High school	27.23% (N=64)
University degrees	30.64% (N=72)

and  $5.59 \pm 2.15$  for women and  $12.54 \pm 3.81$  and  $4.79 \pm 1.92$  for men, respectively ( $P$ -value: 0.009 and 0.004). However the difference in practice score was not statistically significant ( $P$ -value: 0.07).

There was a significant association between the mean knowledge and total scores and level of education ( $P$ : 0.001 and 0.016 respectively), while the same relation was not significant regarding to the practice score ( $P$ -value: 0.40). Another relationship was found between the knowledge score as the independent variable and the practice score as the dependent one ( $R^2=0.242$ ,  $R=0.541$  and  $P$ -value: 0.001)

There was no statistically significant relation between the scores and duration of the disease ( $P$ -value: 0.167, 0.171 and .0193 for knowledge, practice and total score respectively).

There was an inverse but not statistically significant relationship between mean score and mean HbA1c. ( $R=-0.18$ ). Other indicators of disease control (blood pressure and lipid profile) were not related to the scores except for HDL; Pearson or Spearman coefficients and  $P$ -values are demonstrated in table 2.

The least scores in knowledge and practice of our patients were how to select appropriate shoe and how to care their feet, the necessity of regular visit by a dentist and doing it, and regular applying of moisturizing creams on the feet. The lists of all questionnaire items were summarized in table 3;

## Discussion

Our study revealed that patients with type 2 diabetes do not have adequate knowledge about their disease and its complications, especially diabetic foot ulcer, but also do not show proper practice. These findings are comparable to previous studies, Niroomand et al performed a study on 200 in-patients with type 2 diabetes and have revealed that a (8) This latter problem does not seem to merely correlate with knowledge, but it is such a multi factorial and complicated entity in itself which needs to be thought and analyzed in a context of cultural, religious, psychological and some other factors like family support and insurance. (7,9)

One of the most important factors related to patients' knowledge in our studied population was their level of education. Some of previous studies have come to similar results (4-6). Another factor in our study was the duration of the disease which did not seem related with knowledge and practice (with Pearson

**Table 2. The association between knowledge, practice and disease control**

Covariate	Knowledge	Practice	Total
Mean blood pressure	R= -0.05 P=0.60	R= -0.06 P=0.69	R= -0.06 P=0.98
Triglyceride	R= -0.07 P=0.31	R= -0.08 P=0.28	R= -0.08 P=0.25
Total Cholesterol	R= -0.03 P=0.69	R= -0.03 P=0.69	R= -0.04 P=0.59
LDL	R= -0.07 P=0.34	R= -0.15 P=0.04	R= -0.13 P=0.07
HDL	R=0.18 P=0.009	R=0.17 P=0.02	R=0.19 P=0.007

**Table 3. List of questionnaire items**

Field	Category	List of questionnaire items	Correct answer or practice (%)
Diabetic foot ulcer	K	Wound self-treatment	82.4
	K	Foot-care	29.5
	K	Appropriate shoe selection	26.1
	K	Possibility of using a mirror or having help for foot inspection	69.2
	P	Daily foot inspection	59.8
	P	Daily foot washing	59.4
	P	Checking water temperature	67.5
	P	Fully Dry toes	46.2
	P	Daily applying of moisturizing cream on their feet	22.2
	K	Awareness of correct method of trimming toenails	47.4
	P	Regularly trim toenails	47.4
	P	Avoid bare feet	51.3
	P	Wearing socks	83.8
	P	Checking shoes before putting on	59.8
	P	Self-medication for corn	47.8
Disease control	K	Buying shoes at evenings and nights	42.3
	P	Shoe type mostly wore	76.7
	P	Doing regular exercise	67.9
	K	Awareness of necessity of having an annual 24-hr urinalysis	70.5
	P	Annual 24-hr urinalysis	61.5
	K	Awareness of necessity of regular visit by an ophthalmologist	74.4
	P	Regular visit by an ophthalmologist	69.7
	K	Awareness of necessity of having a regular visit by a dentist	32.2
	P	Regular visit by a dentist	24.5
	K	Awareness of role of a tight glycemic control on prevention of diabetic complications	96.6
K	Most important factor(s) in prevention of cardiovascular diseases	91.2	

K stands for knowledge and P for practice

correlation coefficient=0.167 and 0.171 for knowledge and practice respectively) but proved otherwise in an Indian study (5), a difference which may be due to cultural variables.

It has also been shown that diabetic patients' education can effectively raise their knowledge about nature of their disease and influence their practice, which could lead to delay in emergence of complications and can lower disease-related costs. (10)

As mentioned earlier, the practice of patients is a multi-factorial variable which is at least to some extent knowledge-related, but some other factors such as sex-related, psychological, religious and environmental factors along with availability and cost of medical services might have influences on it. (11,9)

Another level above practice and knowledge is attaining to a proper disease control. Our patients did not have an acceptable level of HbA1c (mean HbA1c=7.93%), and the methods and variables used in this study were

not able to fully demonstrate factors influencing control of diabetes in patients. There are lots of factors like health care levels, duration of the disease and age at the onset of the disease which are gathered from both patients and physicians involved to attain a proper control (12,13). But our study only focused on patients' point of view only.

Because of the intertwining nexus of multiple factors which define practice of diabetic patients which in turn can lead to an appropriate disease control, it seems that knowledge is not exclusive factor and maybe it is not even the main factor which can pave the ground for an acceptable control in diabetic patients.

## Conclusions

Based on these findings further studies need to be carried out and should focus on much more patient and physician factors and from both sides of the problem to help diabetic people (14); also, it should be noted that every health system could have patient education programs

based on their cultural and other characteristics of the target population to reach

acceptable results in diabetes management.

## References

- Potluri R, Purmah Y, Dowlut M, Sewpaul N, Lavu D. Microvascular diabetic complications are more prevalent in India compared to Mauritius and the UK due to poorer diabetic control. *Diabetes Res Clin Pract.* 2009;86(2):e39-40.
- Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care.* 2004;27(5):1047-53.
- Esteghamati A, Etemad K, Koohpayehzadeh J, Abbasi M, Meysamie A, Noshad S, et al. Trends in the prevalence of diabetes and impaired fasting glucose in association with obesity in Iran: 2005-2011. *Diabetes Res Clin Pract.* 2014;103(2):319-27.
- Khamseh ME, Vatankhah N, Baradaran HR. Knowledge and practice of foot care in Iranian people with type 2 diabetes. *Int Wound J.* 2007;4(4):298-302.
- George H, Rakesh P, Krishna M, Alex R, Abraham VJ, George K, et al. Foot care knowledge and practices and the prevalence of peripheral neuropathy among people with diabetes attending a secondary care rural hospital in southern India. *J Family Med Prim Care.* 2013;2(1):27-32.
- Tan MY, Magarey J. Self-care practices of Malaysian adults with diabetes and sub-optimal glycaemic control. *Patient Educ Couns.* 2008;72(2):252-67.
- Shilubane HN, Potgieter E. Patients' and family members' knowledge and views regarding diabetes mellitus and its treatment. *Curationis.* 2007;30(2):58-65.
- Niroomand M, Ghasemi SN, Karimi-Sari H, Kazempour-Ardebili S, Amiri P, Khosravi MH. Diabetes knowledge, attitude and practice (KAP) study among Iranian in-patients with type-2 diabetes: A cross-sectional study. *Diabetes & metabolic syndrome.* 2016;10(1 Suppl 1):S114-9.
- Lautenschlager L, Smith C. Low-income American Indians' perceptions of diabetes. *J Nutr Educ Behav.* 2006;38(5):307-15.
- MakkiAwouda FO, Elmukashfi TA, Hag Al-Tom SA. Effects of health education of diabetic patient's knowledge at Diabetic Health Centers, Khartoum State, Sudan: 2007-2010. *Glob J Health Sci.* 2014;6(2):221-6.
- Kaceroovsky-Bielez G, Lienhardt S, Hagenhofer M, Kaceroovsky M, Forster E, Roth R, et al. Sex-related psychological effects on metabolic control in type 2 diabetes mellitus. *Diabetologia.* 2009;52(5):781-8.
- Xiao H, Tian H, Lu Y, Li C, Fang F, Miao X, et al. [Blood glucose control and its influencing factors in elderly type 2 diabetics under different health care levels]. *Zhonghua Yi Xue Za Zhi.* 2014;94(2):104-9.
- Al Shahrani A, Baraja M. Patient Satisfaction and it's Relation to Diabetic Control in a Primary Care Setting. *J Family Med Prim Care.* 2014;3(1):5-11.
- Daly JM, Hartz AJ, Xu Y, Levy BT, James PA, Merchant ML, et al. An assessment of attitudes, behaviors, and outcomes of patients with type 2 diabetes. *J Am Board Fam Med.* 2009;22(3):280-90.