



## Study of effectiveness of diabetic care (Type II) in Larestan-2015

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### ABSTRACT

Considering the high prevalence of Type 2 diabetes and importance of the care quality to reduce its complications and mortality and costs resulting from it, the effectiveness of type 2 diabetic patients' care in Larestan was studied in 2015. The present study is of cross-sectional analytical kind. The statistical universe studied includes all Type 2 diabetic patients of Larestan having an active file in the health center. The sample size in the group under care was estimated 247 people and in the group of non care was 108. It means total sample of studied consists of 355 people. The present research was performed in three stages including (1) interviewers training and checklist completing (2) somatometrics and (3) blood sampling. After determining the answers of the test the above cases were analyzed by software SPSS and T-Test and descriptive statistic analysis method. In the present research the average and standard deviation related to the age of patients under the care were equal to  $58.93 \pm 9.53$  and those of the uncared patients were  $59.95 \pm 9.52$ . 237 individuals (66/8%) were females and 118 individuals (33/2%) were males. In this research 355 type 2 diabetic patients in Larestan were evaluated. 247 (69.6%) were the patients under care and the remainings (108 equal to 30.4%) were the patients uncared. 52/7% subjects resided in the cities and 47/3% were rurals. 58/3% subjects were illiterate and 28/7% of them had primary education and 7/9% had secondary education and 3% had high school education and only 2% were graduated. In terms of job, 66/2% of them were housekeepers, 12/4% had free job, 2% were employee, 13% were unemployed, 3/9% were retired and 2/5% were farmers and ranchers. 87% were married. Considering the present research the quality and effectiveness of care status related to the diabetic patients of Larestan is better than that of country's patients but is far from ADA standards.

**Keywords:** Type 2 diabetes, Care effectiveness, ADA

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### INTRODUCTION

In times past the contagious diseases were a main health problem around the world. Promoting the general health level and controlling the contagious diseases has resulted in changing the epidemiologic trend of diseases from contagion towards chronic and non contagious diseases. Diabetes as the most prevalent disease resulting from the metabolic disorders and the fourth cause of mortality in terms of treatment costs and disability is very important (Alavi nia et al. 2012). According to the report 2014 more than 382 million individuals suffer from this disease. Based on WHO estimation the number of diabetic patients will be above 592 million individuals up to 2035 and in Iran they will be more than 8 million (IDF, 2014).

There are several definitions for diabetes that the most simple of them is to increase blood sugar level more than normal limit (Noorabadi et al, 2011). Diabetes symptoms include overdrinking, overfeeding and diuresis and long and over fatigue (Peyman pour et al, 2011). The disease diagnosis is based on the following measures:

a) Two times the venous plasma glucose more than 126 mg/deciliter)

- b) Plasma glucose two hours after receiving 75 g glucose more than 200 mg/deciliter)  
c) Hemoglobin A1C more than and equal to 6/5 % ( ADA, 2015).

There are several types of diabetes as follows:

Type 1 diabetes resulting from destructing chronically pancreas  $\beta$  cells happens in children and young adults.

Type 2 diabetes resulting from the relative or complete resistance to insulin is the most common form of diabetes, About 90% diabetic cases are with type 2 diabetes. gestational diabetes is due to glucose metabolic changes happening for the first time during pregnancy. The special types of diabetes may develop due to some certain causes or using some drugs, infections or immune system disorders (Noorabadi et al, 2011). Studies show the increase of diabetes complications (Abedini et al, 2008). Preventing the complications results in increasing the patients' health level (Abedini et al, 2008). Diabetes has several complications including ocular, renal, cardiovascular and vasoneural complications. Diabetes is the most common cause of blindness and leg amputation in adults around the world. In every 30 seconds one person loses his/her leg due to diabetes. Diabetes is the most important cause of chronic kidneys failure. In some developing countries like Saudi Arabia and United Arab Emirates, 2/5 to 15% of total health budget is allocated to diabetes. In Iran, diabetic patients' treatment cost is about one milliard dollars (Noorabadi et al, 2011). One of the major reasons of the early mortality is diabetes and its side effects. Cardiovascular complications are one of the main reasons of death in diabetics and in some countries diabetes is responsible for more than 50% mortality. Considering the importance of diabetes and mortality and direct and indirect costs and complications resulting from it Non Contagious Diseases Center of Iran accomplished to integrate the diabetes control and care program in the treatment and health system since 2004 (Alavi nia et al, 2012). All diabetic patients must be controlled by health visitors and receive the required educations on diet program, exercise and physical activity and regularly use their drugs and visit for re-care. Also the patients should be visited every three months by a doctor to control and measure the fasting blood glucose and hemoglobin A1c, blood pressure, end organs examination and studying the neural complications and risk factors of cardiovascular diseases and ocular complications (Delavari et al, 2004). According to a research in England the optimal diabetes care alongside the reduction of 1% hemoglobin A1c will result in reducing 25% mortality related to diabetes (Hayden, 1998). The successful and effective care of diabetic patients based on ADA guideline includes medical history, clinical examinations and laboratory studies and timely referrals (ADA, 2013, Dallo FJ 2009). Studying the care quality of the current programs including diabetes is necessary and can results in a better planning to provide the more desired care service (Fung Cs, 2012). Considering the following points makes unavoidable the necessity of the present research:

- Considering the big number of the diabetic patients and mortality and disabilities resulting from it.
- The heavy economic load burdening to the families, community and governments.
- Increasing the patients during the recent years.

## EXPERIMENTAL SECTION

### Research background

Ali Delpishe, Hossein Azizi, Elham Davtalab Esmaili performed a research on 380 diabetic patients of type 2 in Malekan in 2012. After analyzing data by the software SPSS, they concluded that the care quality of diabetic patients in the studied region was close to the national research but was very far from the standards determined by ADA (Delpishe et al, 2016). A population consisting of 624 type 2 diabetic patients was studied by Montazem, Soleimany, Hoseiny, Zemestany, Haghiry, Mojtahedi, Amini and Hemati. Data was analyzed by the software SPSS. They concluded that the care quality of diabetic patients in the studied region was close to the national research but was very far from the standards determined by ADA (Montazem et al., 2013). Ataie, Shamshirgaran, Iranparvar Alamdari and Safaian selected 300 diabetic patients in Ardabil in 2014. They concluded that the diabetic patients care status is very far from the standards determined by ADA (Ataie et al. 2014).

A research in England shows that a desired diabetes care accompanying with the reduction of 1% hemoglobin A1c results in reducing 25% mortality due to diabetes (Hayden, 1998).

### Method

The present research is of cross-sectional analytical kind. The sample universe included all type 2 diabetic patients in Larestan who had an active file in the health centers. The criteria required to participate in this research included all type2 diabetic patients in the age range of 20 to 80 years, not to have background disease except hypertension. If the subjects had a background disease, the other types diabetes and disinclination for continuing the study, they would be deleted. The criterion to dissociate the patients into the group under care was 9 times of

care by nurses' aided or 3 times of care by doctor, otherwise, the patient was not considered into the group under care. To determine the sample size in the present research, the following formula was used

$$n = \frac{2\sigma^2(Z_{1-\alpha/2} + Z_{1-\beta})^2}{d^2}$$

Where  $\sigma$  is the common standard deviation of two groups. HbA1c is one of the important factors in patients' care which is selected as the index and the standard deviation equal to 1/7 in the previous studied was placed in this formula.  $Z_{1-\alpha/2}$  is confidence level selected 0/95.  $Z_{1-\beta}$  is study power which is considered 0/8. D is acceptable error (that is, Effect size) which is equal to 0.05. Considering the following cases, the sample size in the group under care was estimated 247 subjects and in uncared group was 108 subjects. It means total sample studied included 355 subjects who place in the group under care and uncared group, as follows:

Sampling was performed in the systematic random method. Firstly, the list of patients was extracted into the patients under care and uncared patients and then the patients studied in both groups were selected. All diabetic patients studied were taken a written agreement. The research information includes one demographic inventory (age, gender, residency, marital status, job, education) and the care information (height, weight, waist girth, hip girth, blood pressure, smoking history, diabetes history in relatives, physical activity, using fruits and vegetables, the number of cares by nurses' aided, disease duration, background disease, blood pressure history, the number of cares by doctor, complications: FBS, HbA1c, TG, ChoL, LDL, HDL). In the present study, after training the interviewers and completing checklist (first step) somatometrics (second step) were performed. Then third step that is blood sampling was done. After it, the answers were analyzed by software SPSS and T-Test method.

## RESULTS

In the present research the average and standard deviation of the age related to the patients under care was equal to  $58.93 \pm 9.53$  and those of the uncared patients were  $59.95 \pm 9.52$ . 237 patients (66.8%) were females and 118(33.2%) were males. In the present research 355 type 2 diabetic patients of Larestan were evaluated. From these, 247 subjects (69.6%) were patients under care and the remaining patients - 108 subjects (30.4%) were uncared patients. 52.7% of the subjects were resident of towns and 47.3% were in villages. 58/3% subjects were illiterate and 28/7% of them had primary education and 7/9% had secondary education and 3% had high school education and only 2% were graduated. In terms of job, 66/2% of them were housekeepers, 12/4% had free job, 2% were employee, 13% were unemployed, 3/9% were retired and 2/5% were farmers and ranchers. 87% were married.

married					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	single	7	2.0	2.0	2.0
	married	309	87.0	87.0	89.0
	divorce	3	.8	.8	89.9
	widow	36	10.1	10.1	100.0
	Total	355	100.0	100.0	

In terms of smoking history: 78.3% hadn't any smoking history and 21.7% had it  
:In terms of hypertension history, their status was as follows:

History of blood pressure					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	175	49.3	49.3	49.3
	no	180	50.7	50.7	100.0
	Total	355	100.0	100.0	

.In terms of diabetes history in their relatives, 69.9% of them were with diabetes and 30.1% hadn't.  
.In terms of prevalence of diabetes risk factor that is, lack of physical activity, 49% hadn't it.

physical Activity					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3 times and more in a week	93	26.2	26.2	26.2
	1 to 2 times in a week	87	24.5	24.5	50.7
	no activity	175	49.3	49.3	100.0
	Total	355	100.0	100.0	

.In terms of using fruits and vegetables , 68% of patients used fruits and vegetables .

Vegetable and fruit use					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	daily	243	68.5	68.5	68.5
	3 to 4 times in a week	64	18.0	18.0	86.5
	1 to 2 times in a week and less	48	13.5	13.5	100.0
	Total	355	100.0	100.0	

In terms of studying complications based on their self-reporting and the patients' record , their status was as follows :

52.4% subjects didn't report any complications . 16.9% reported the ocular complications and 7.3% reported cardiovascular complications and 4.2% and 2.8% reported renal and vasoneural complications , respectively . Also , 16.4% of subjects were with more than one complication resulting from diabetes .

The average and standard deviation of HBA1C in the patients under care was  $8.73\pm 1.93$  and in the uncared patients was  $8.78\pm 2.05$ .

31% subjects had HBA1C less than 7.5 and 27% had HBA1C between 7.5 to 9 and 42% had HBA1C higher than 9. 49.3% of the patients were with hypertension history and 50.7% of them hadn't . The systolic blood pressure and standard deviation of the patients under care were  $123.61\pm 15.72$  and in the uncared patients were  $123.6\pm 15.59$ . The diastolic blood pressure and standard deviation of the patient under care was  $76.76\pm 10.95$  and in the uncared patients were  $77.04\pm 13.30$ . The value of LDL and standard deviation of the diabetic patients under care were  $98.87\pm 32.65$  and in the uncared patients were  $102.09\pm 30.21$ .

## RESULTS AND DISCUSSION

In the present research the average of HBA1C in the diabetic patients under care was  $8.73\pm 1.93$  which is in the range of medium care . Comparing it with the studies of Montazem *et al* (2013) , Ataie *et al* (2014) and the study of Diabetes control quality in Iran by Amini *et al* (2008) show that the care status in Larestan is better than the national average but is very far from ADA guidelines . It also demonstrate that the average of HBA1C in the diabetic patients under care is less than that of uncared patients and is closer to ADA standards .The average of the systolic blood pressure of the diabetic patients under care was  $123.61\pm 15.72$  that comparing with the study of Ataie *et al* (Ataie, 2014) showed a better status and was better than the value determined by ADA(135) . . The diastolic blood pressure and standard deviation of the patient under care was  $76.76\pm 10.95$  that it showed a similar status comparing with the study of Ataie *et al* (2014) and was better than the value determined by ADA(85) .. The value of LDL and standard deviation of the diabetic patients under care were  $98.87\pm 32.65$  . In comparison with the national study of Tabatabaie *et al* about diabetes ( 2010)being equal to  $101.01\pm 35.31$  was better than the national average . Also , in the comparison with ADA standard which has determined a value less than 100 , we have a better status .

The value of LDL in the uncared diabetic patients was  $102.09\pm 30.21$  which was higher than the value determined by ADA and was similar to the national study of Tabatabaie (2010) . In terms of using fruits and vegetables , 68% of patients daily used fruits and vegetables showing they are richer than the others .

## CONCLUSION

Considering the present research the quality and effectiveness of the diabetic patients' care status of Larestan is better than the national status but also it is very different from ADA standards . Therefore , it is advised that promoting the diabetic patients' care quality is considered according to the national and ADA standard guidelines and also the modern technologies are applied .

**Enclosure**

Check list of studying the effectiveness of type 2 diabetic patients care 2015, Larestan  
Demographic Information

Address and phone number	Residency <input type="checkbox"/> town <input type="checkbox"/> village	Gender <input type="checkbox"/> male <input type="checkbox"/> female	Birth date : 13 / /	Name and surname
	Marital status <input type="checkbox"/> single <input type="checkbox"/> married <input type="checkbox"/> divorced <input type="checkbox"/> widow	job: <input type="checkbox"/> housekeeper <input type="checkbox"/> employee <input type="checkbox"/> farmer <input type="checkbox"/> free job <input type="checkbox"/> unemployed <input type="checkbox"/> retired <input type="checkbox"/> educational and management jobs	Education : <input type="checkbox"/> highschool <input type="checkbox"/> diploma <input type="checkbox"/> A.A <input type="checkbox"/> B.A. <input type="checkbox"/> M.A and higher	

**Care Information**

Diabetes history in relatives: <input type="checkbox"/> yes <input type="checkbox"/> no	Smoking history: <input type="checkbox"/> yes <input type="checkbox"/> no	Blood pressure : systole diastole:	Waist girth : cm)(  Hip girth: cm)(	Height :cm):(  Weight :kg):(
CL:  HDL:  LDL:	FBS:  HbA1C:  TG:	Test date :  13 / /	Using fruits and vegetables <input type="checkbox"/> daily <input type="checkbox"/> 3 to 4 times in a week <input type="checkbox"/> 1 to 2 times in a week or less	Physical activity : <input type="checkbox"/> times and higher in a week <input type="checkbox"/> 1 to 2 times in a week <input type="checkbox"/> no physical activity
: complications <input type="checkbox"/> ocular <input type="checkbox"/> renal <input type="checkbox"/> cardiovascular <input type="checkbox"/> vasoneural		Hypertension history <input type="checkbox"/> yes <input type="checkbox"/> no	Background disease : <input type="checkbox"/> yes <input type="checkbox"/> no	Disease duration )year:(  :number of referrals in the past year

:name and surname of complementary

complement date

:

Signature

**REFERENCES**

[1]Amini, M;Gooya, M; Delavari,A; Mahdavi,A; Tabatabaie,A; Haghghi,S; **2008**, *Scientific Magazine of Iran Medical System Organization* , 26, 20-29.  
 [2]Peymanpour,H; Faramarzi,H. Ershad, M; **2005**. *Diabetes* . 35.  
 [3]Delpishe , A; Azizi,H; Davtalab, E.;Haghiri, L.; Karimi, Gh ; Abbasi, F; **2016**, *Metabolism and Diabetes Magazine of Iran* , 14, 189-198.  
 [4]Delavari, A; Mahdavi, A.; Noorinejad, , A. ; Yar Ahmadi, SH . **2004**. *Diabetes and Doctor*. 57-60.  
 [5]Tabatabaie, A.; Peymany, M.; Heshmat , R.; Pajoohi, M.; **2010**. Status of Diabetes cCare in Diabetic Old men in Diabetes Clinic, Shariati Hospital . *Iran Lipid and Diabetes*, 10, 161-169.  
 [6]Abedini,Z.; SHOari,A.; Ahmari,H. *Ghom Medical sciences*, 2, 37-41.  
 [7]Ataie,J.; Shamshigaran, M.; Alamdari, M.; Safaian, A. **2014**. Studying the Quality of Type 2 Diabetic Patients Care based on Scoring System I Ardabil. *Ardabil medical sciences magazine*, 15, 208-219.  
 [8]Alavi nia, M. ; Ghotbi, M.; Mahdavi, H. A. ; Kermanchi, J. Nasli , E.; Yarahmadi, Sh.; **2012**. National Program to Prevent and Control Type 2 *Diabetes* . 1, 1, 3.

[9]Montazem, H.; Soleymani, A.; Hosseyni, H. ; Zemestani, A.; Haghiri L. ; Mojtahedi, .; Amini, E.; Hemati, N.; **2013**. *North khorasan Medical Sciences Magazine* , 3.

[10]Noorabadi, Gh.; Mahdavi, A. ; vardipour, H.; Dstgiri, S,; Shakibfar,F.; Shahabbasi, J.; **2011**. *Training , Preventing and Controlling Diabetes*. 85, 80, 82, 79, 78, 50 .