

## Effect of educational program on lifestyle for patients with non-insulin-dependent diabetes mellitus

Reda Mohamed El-sayed Ramadan<sup>1</sup>khadiga A  
Gomma Hassan<sup>2</sup>Rahma AbdElgawad M. Elkalashy<sup>3</sup>Abla F. A. Saad<sup>4</sup>Tahany El-  
Sayed El-Sayed Amr<sup>5</sup>

<sup>1</sup>(Assistant Professor of Medical Surgical Nursing, College of Applied Medical Science, Shaqra University, KSA)

<sup>2</sup>(Assistant Professor of Pediatric Nursing, College of Applied Medical Science, Shaqra University, KSA)

<sup>3</sup>(Assistant Professor of Medical Surgical Nursing, College of Applied Medical Science, Shaqra University, KSA)

<sup>4</sup>(Assistant Professor College of Applied Medical Science, Shaqra University, KSA).

<sup>5</sup>(Assistant Professor of Maternal and Newborn Health Nursing, College of Applied Medical Sciences, Shaqra University, KSA).

Corresponding Author: Dr. Rahma AbdElgawad M. Elkalashy

---

### Abstract:

**Background:** Non-insulin-dependent diabetes mellitus (NIDDM) is a metabolic disease associated with a wide range of comorbidities and complications, including retinopathy, nephropathy, peripheral neuropathy, and cardiovascular diseases. It is increasingly in Saudi Arabia primarily because of increases in the prevalence of a sedentary lifestyle and obesity. Evidence suggests that lifestyle can delay and even prevent the development of NIDDM and its complications.

**Objective:** Evaluate effect of the educational program on lifestyle for patients with NIDDM.

**Research hypothesis:** Educational program has positive effect on lifestyle for patients with NIDDM. **Sample:** the study subjects consisted of 57 female patients diagnosed with NIDDM at the outpatient clinic of Shaqra General Hospital.

**Tools of data collection:** 1) Diabetes assessment questionnaire sheet; to assess personal and health related data including family history and smoking habits 2) Patient's level of knowledge, and 3) Lifestyle questionnaire for patients with NIDDM.

**Results:** Regarding age, it was 21-73 years old. There are significant differences regarding level of knowledge, and lifestyle after educational program. **Conclusion:** Educational program implementation improved patients' knowledge, and lifestyle.

**Recommendation:** Setup a project that aims to improve patients' lifestyle.

**Keywords:** Educational program, Lifestyle, Non-insulin-dependent diabetes mellitus

---

Date of Submission: 13-11-2018

Date of acceptance: 28-11-2018

---

### I. Introduction

Diabetes mellitus (DM) is a group of metabolic diseases resulting from inherited and/or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced. Such a deficiency results in hyperglycemia, which in turn damage many of the body's systems, in particular the blood vessels and nerves<sup>1</sup>.

DM is a growing global health concern. In 2000, diabetes affected an estimated 171 million people worldwide; by 2011 this had increased to more than 366 million and numbers are expected to exceed 552 million by 2030. The highest prevalence of diabetes overall is anticipated to occur in the Middle East and North Africa due to rapid economic development, suburbanization and deviations in lifestyle patterns in the region<sup>2</sup>.

Saudi Arabia is not excluded from this worldwide epidemic<sup>3</sup>. In 2015, 4660 patients with diabetes attended the family and medical clinics across Saudi Arabia<sup>4</sup>. This increasing problem of diabetes is due to various factors, including an increasing obesity rate and an aging population<sup>5</sup>. The three commonest types of diabetes are Type 1 Diabetes Mellitus (T1DM), Type 2 Diabetes Mellitus (T2DM) and Gestational Diabetes Mellitus (GDM)<sup>2</sup>.

---

T2DM is the most common form of diabetes<sup>6</sup>. It known as adult-onset or noninsulin-dependent diabetes (NIDDM)<sup>7</sup>. NIDDM is the most common form of DM, which accounts for 90% to 95% of all diabetic patients<sup>8</sup> and is expected to increase to 439 million by 2030<sup>9</sup>.

Although NIDDM patients are generally independent of exogenous insulin, they may need it when blood glucose levels are not well controlled with diet alone or with oral hypoglycemic drugs. In addition, patients with NIDDM are often accompanied by complications, such as cardiovascular diseases, diabetic neuropathy, nephropathy, and retinopathy. Diabetes and its associated complications lower the quality of people's lives and generate enormous economic and social burdens<sup>10</sup>.

Strict glucose control can delay or prevent the progression of complications associated with diabetes<sup>11,12,13</sup> and there is also substantial evidence that leading a healthy lifestyle, including following a healthy diet, achieving modest weight loss, and performing regular physical activity can maintain healthy blood glucose levels and reduce the risk of complications of type 2 diabetes<sup>14,15</sup>.

### **Significance of the Study**

NIDDM is the most common form of DM characterized by increased concentrations of glucose in the blood, insulin resistance, and relative insulin deficiency<sup>16</sup>. It results from interaction between genetic, environmental and behavioral risk factors<sup>17,18</sup> (*Chen, Magliano, Zimmet, 2011 and Advances and emerging opportunities in diabetes research, 2011*).

NIDDM is a lifelong disease and can lead to severe complications<sup>11</sup> and increased risk for mortality<sup>19</sup>. Worldwide, approximately 5.1 million people aged between 20 and 79 years died from diabetes in 2013, accounting for 8.4% of mortality among people in this age group<sup>20</sup>. In Saudi Arabia, the epidemiologic transition has been fast and complete. During the last 4 decades, rapid economic growth has led to a remarkable increase in living standards and adoption of a 'Westernized' lifestyle, characterized by decreased physical activity and unhealthy dietary patterns<sup>21</sup>.

Treatment in NIDDM usually begins with prescriptions for weight loss and increased activity. If these changes can be sustained, no further treatment will be necessary for many individuals. Lifestyle modifications are an opportunity for diabetics to take charge of their health. Hypoglycemic medications are begun when lifestyle changes are insufficient<sup>22,23</sup>. Therefore, the present study contributes to evaluate effectiveness of educational program on lifestyle for patients with noninsulin-dependent diabetes.

**Aim of the study:** The aim of the current study was to evaluate effectiveness of educational program on lifestyle for patients with noninsulin-dependent diabetes.

**Research hypothesis:** Educational program has positive effect on lifestyle for patients with noninsulin-dependent diabetes.

## **II. Methods**

**Research Design:** The quasi-experimental design was utilized to achieve the aim of current study.

**Setting:** The study was conducted at the outpatient clinic at Shaqra General Hospital.

### **Sample size:**

A purposeful sample of 57 female patients their age between 21-73 years old and diagnosed with type 2 diabetes mellitus. The researchers selected patients who the following inclusion criteria: their ages > 18 years, agree to participate in the study and had diabetes mellitus only. Patients experiencing cognitive impairment, and alcohol or drug abuse were excluded from the study. A Power of .95 ( $1 - \beta = .95$ ) at alpha .05 (one-sided) with medium effect size (0.3) was used as the significance level, because these levels have been suggested for use in the most areas of research.

### **Tools for data collection:**

**1- Diabetes assessment questionnaire sheet:** include:

- A. Personal data of the participants such as** age, marital status, educational level and occupation.
- B. Health related data as,** weight, height, smoking habits, and family history as well as disease history of patients. According to the<sup>24</sup>, Body mass index was calculated according to weight and height of patient. A BMI of less than (18.5) was underweight, a BMI from (18.50 - 24.99) considered normal while a BMI from (25 - 29.9) considered overweight and  $\geq 30$  was considered obese.

### **2- Patients' level of knowledge**

It was developed by the researcher after reviewing the related literature in order to assess patient's level of knowledge before/ after implementation of educational program in relation to definition of diabetes, management, and complications<sup>23,25</sup>. Reliability test were done whereas Cronbach's Alpha equal 0.70

**Scoring system:**

Each correct answer had one mark while the incorrect one had zero.

**The total score was divided into two categories as follows:**

- < 60% was graded as unsatisfactory level of knowledge.
- ≥ 60% was graded as satisfactory level of knowledge.

**3- Lifestyle questionnaire for patients with type 2 diabetes**

It was developed by the researcher after reviewing the related literature. This tool is used to assess the patient's health-related behaviors before/ after implementation of educational program. This sheet is guided by <sup>22,26</sup>. Reliability test were done whereas Cronbach's Alpha equal 0.80

**Scoring System:**

It was divided into 10 parts. Each one of them contains a number of statements about lifestyle, and scored as; Never=0, Rare=1, Sometimes=2, Often=3, Always=4.

**Procedure**

The aim of the study and component of the tools were explained to patients at the beginning of data collection. The researchers filled the data collection tools within 30-45 minutes. Patient's socio-demographic characteristics, medical data and problems as expressed by patients were filled before implementation of educational program while knowledge and lifestyle were filled before implementation of program and after three months from the last session.

**Implementation of educational program is done in the following manner:**

Every subject was interviewed individually at waiting-room. After completing the interview questionnaire, patient assessment sheet, and lifestyle assessment sheet, the researcher organized with the patient the schedule of sessions of educational program. Each session of educational program consumed 45-60 minute/day in 3 days per week. These sessions were giving in the form of group, each group number not exceed five patients.

**Pilot study;**

Tools of the study were tested on 10 patients fulfilling the selected criteria. They were later excluded from the main study sample. The pilot study was carried out to check clarity, relevance and feasibility of the tools, and to estimate the time required for interviewing the patient. Based on the opinion of a panel of nine experts and the result of the pilot study, modifications and omissions of some items were done, and then the final forms were developed.

**Ethical Considerations**

Prior to the conduction of the study, ethical approval was obtained from the responsible authorities after explanation its purpose. Participants were assured that anonymity and confidentiality would be guaranteed and that, they have the right to withdraw from the study at any time without giving any reason.

**Statistical Design:**

Data were presented in tables using numbers and percentages. The statistical analysis included percentage (%), mean, standard deviation (SD), range and T-test. The observed differences, and associations were considered statistically significant  $P < 0.05$ .

**III. Results**

**Table (1):** Number and percentage distribution of socio-demographic characteristics among patients under study, n= 57.

Items	No.	%
Age (years):		
< 30	14	24.6
≥ 40 < 50	20	35.1
≥ 50	23	40.3
Range:	21-73	
Marital status:		
Single	11	19.3
Married	34	59.6
Divorced/ Widowed	12	21.1
Education:		

Illiterate	15	26.3
Read/write and basic/intermediate	22	38.6
High	20	35.1
Job:		
Work	31	54.4
Not Work	26	45.6

Table (1), shows that, slightly more than two fifths of patients (40.3%) their age 50 years old or more. Regarding to patients' work, more than half of them (54.4%) are working. In relation to marital status, more than half of patients (59.6%) were married.

Concerning the educational level of the patients included in the study, more than one quarter of them (26.3%) were illiterate, while (35.1%) of them were highly educated.

**Table (2):** Number and percentage distribution of smoking habit among patients under study, n= 57.

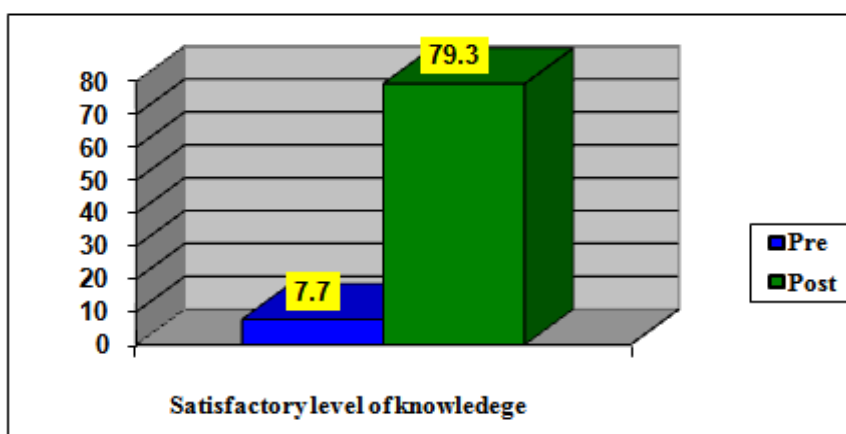
Items	No.	%
Non-smoker	57.0	100.0
Passive smoking:		
Exposed	27	47.4
Not exposed	30	52.6

Table (2), shows that all patients (100.0%) were non-smokers, while less than half of them (47.4%) were exposed to passive smoking.

**Table (3):** Percentage distribution for disease characteristics, and anthropometric measurements for patients under study n=57.

Items	No.	%
Positive family history for diabetes	21	36.8
Duration of DM: (In Years):		
≥ 1 < 3	18	31.6
≥ 3 < 5	31	54.4
≥ 5	8	14.0
Treatment:		
Tablet	12	21.1
Insulin	34	59.6
Both	11	19.3
Body mass index:		
Normal	9	15.8
Overweight	21	36.8
Obese	27	47.4

Table (3), shows that, more than one third of patients included in the study (36.8%) have positive family history of diabetes. In relation to history of chronic illness, 31.6 % of patients under study had diabetes for 1 year and less than 3 years and more than half of them (59.6%) were on insulin. As regards body mass index, more than two fifths of patients (47.4%) were obese.



**Figure.(1):** Effect of educational program for patients under study on their satisfactory level of knowledge

Regarding to satisfactory level of knowledge, more than three quarters of patients under study (79.3%) had satisfactory level of knowledge about diabetes with statistically significant difference post educational program implementation.

**Table (4):**lifestyle of patients under study pre and post implementation of educational program.

Indicators	Studied group n = (57)		P value
	Pre	Post	
Dietary regimen	40.6±39.89	45.1±6.77	.000*
Exercise	8.7±2.75	12.1±3.88	.000*
Passive smoking	2.5±1.55	4.4±1.70	.000*
Self-monitoring gluco-check	16.5±3.62	20.6±4.75	.000*
Medication	11.5±10.69	14.2±3.58	.000*
Psychological issues	11.8±2.82	15.7±3.25	.000*
Social issues	11.9±2.48	13.8±1.72	.000*
Emotional issues	15.0±13.32	17.7±4.22	.000*
Spiritual issues	13.4±2.98	16.6±2.15	.000*
<b>Total</b>	<b>132.2±44.87</b>	<b>160.7±17.07</b>	<b>.000*</b>

\* Significant

Table (4) reveals that there was an increase in mean and stander deviation among patients under study post educational program implementation regarding lifestyle items including dietary regimen, exercise, passive smoking,self-monitoringgluco-check, medication, and psychological, social, emotional and spiritual issues.

#### IV. Discussion

The proportion of people with type 2 diabetes is on the rise and is a major cause of death world-wide. Type 2 diabetes is a major risk factor for vascular disease with 65% of all diabetic deaths being due to cardiovascular disease<sup>27</sup>.Lifestyle characteristics, such as physical activity, diet, and stress are important factors that influence development and prognosis of type 2 diabetes<sup>28</sup>. Changes in diet and increase in physical activity and exercise are key components of the management of type 2 diabetes<sup>29</sup> and guidelines recommend changes in these lifestyle characteristics for both prevention and management of the disease<sup>30</sup>. So, the aim of this study was to evaluate the effect of educational program on lifestyle for patients with noninsulin-dependent diabetes.

Findings of this study revealed that two fifths of patients were 50 years and more than two fifths of them were obese. This finding supported by<sup>31</sup>, who mentioned that, type 2 diabetes diagnosed in adults over age 40 and majority of those are obese.

In relation to family history of diabetes, less than two fifths of patients had positive family history. This finding is corresponding with<sup>22</sup>, who stated that, a positive family history of diabetes has been associated with increased risk for type 2 diabetes.

In the present study, all patients were non-smoker. This might be due to the fact that, the subjects were female. Regarding to patients' level of knowledge, the present study revealed that there was a statistically significant difference in patients' knowledge between pre/post educational program implementation. This difference in knowledge found in the present study might be related to the knowledge acquired from the program. This is similar to<sup>32</sup>, who stated that, patients with diabetes who received program had improvement of their knowledge after implementation of the program.

The present study findings reported that, there was a statistically significant difference among the study group pre/post educational program implementation regarding to lifestyle including dietary regimen, exercise, passive smoking,self-monitoringgluco-check, medication, and psychological, social, emotional and spiritual issues. This might be due to that patients after program became more knowledgeable and able to perform essential skills such as exercise. This finding was supported by<sup>33</sup>, who stated that lifestyle for cardiovascular disease-associated risk factors in patients with type 2 diabeteswere improved after implementation of the program.

#### V. Conclusion

**Results of this study concluded that** application of educational program has statistically significant positive effect on modifying patient's lifestyle. So, the present study findings support the hypothesis that educational program will modify lifestyle of patients with noninsulin-dependent diabetes.

#### Recommendation

- Setup a project that aims to improve patients' lifestyle.
- The nurses should be trained to conduct evidence based educational program andlifestyle guidelines for patients with non-insulin-dependent diabetes mellitus.

- Patients with non-insulin-dependent diabetes mellitus should be aware that healthy lifestyle is an integral part of management of blood glucose level.

### References

- [1]. World Health Association. The worldwide epidemiology of type 2 diabetes mellitus--present and future perspectives.2018.<http://www.who.int/mediacentre/factsheets/fs138/en/>
- [2]. International Diabetes Federation. Diabetes Atlas (7th ed). 2015. [http://www.idf.org/sites/default/files/EN\\_6E\\_Atlas](http://www.idf.org/sites/default/files/EN_6E_Atlas)
- [3]. Alhawaish. Economic costs of diabetes in Saudi Arabia J Family Commun Med, 20 (1) (2013), p. 1
- [4]. The Ministry of Health. Statistics report 2015. <http://www.moh.gov.sa/en/Ministry/Statistics/boo>
- [5]. Kearns, A. Dee, A.P. Fitzgerald, E. Doherty, I.J. Perry Chronic disease burden associated with overweight and obesity in Ireland: the effects of a small BMI reduction at population levelBMC Public Health, 14 (1) (2014), p.1
- [6]. American Diabetes Association. Diagnosis and Classification of Diabetes Mellitus.2018. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2613584/>
- [7]. Mayo Foundation for Medical Education and Research. 2018. <https://www.mayoclinic.org/diseases-conditions/type-2-diabetes/symptoms-causes/syc-20351193>
- [8]. Tripathi BK, Srivastava AK. Diabetes mellitus: complications and therapeutics. Med SciMonit. 2006; 12(7): RA130–147.
- [9]. Chen L, Magliano DJ, Zimmet PZ. The worldwide epidemiology of type 2 diabetes mellitus--present and future perspectives. Nat Rev Endocrinol. 2011; 8(4): 228–236.
- [10]. Zhao Y, Jiang Z, Guo C. New hope for type 2 diabetics: Targeting insulin resistance through the immune modulation of stem cells. Autoimmun Rev. 2011; 11: 137–142
- [11]. American Diabetes Association Standards of Medical Care in Diabetes—2014. Diabetes Care 2014;37(Suppl. 1): S1–S80
- [12]. Miller KM, Beck RW, BergenstralRM, et al.; T1D Exchange Clinic Network. Evidence of a strong association between frequency of self-monitoring of blood glucose and hemoglobin A1c levels in T1D Exchange clinic registry participants. Diabetes Care 2013;36:2009–2014
- [13]. Holman RR, Paul SK, Bethel MA, Matthews DR, Neil HA. 10-year follow-up of intensive glucose control in type 2 diabetes. N Engl J Med 2008; 59:1577–1589
- [14]. Norris S, Zhang X, Anvenell A, et al. Long-term effectiveness of weight-loss interventions in adults with pre-diabetes: a review. Am J Prev Med 2005; 28:126–139
- [15]. Klein S, Sheard N, Pi-Sunyer X, et al. Weight management through lifestyle modification for the prevention and management of type 2 diabetes: rationale and strategies. A statement of the American Diabetes Association, the North American Association for the Study of Obesity, and the American Society for Clinical Nutrition. Am J ClinNutr 2004; 80:257–263
- [16]. Maitra A, Abbas AK. Endocrine system. In: Kumar V, Fausto N, Abbas AK (eds). Robbins and Cotran Pathologic basis of disease (7th ed) 2005. Philadelphia, Saunders; 1156-1226.
- [17]. Chen L, Magliano DJ, Zimmet PZ. The worldwide epidemiology of type 2 diabetes mellitus--present and future perspectives. Nat Rev Endocrinol. 2011; 8(4): 228–236.
- [18]. Advances and emerging opportunities in diabetes research: a Strategic Planning report of the DMICC. Genetic basis of type 1 and type2 diabetes, obesity, and their complications. [www2.niddk.nih.gov/NR](http://www2.niddk.nih.gov/NR) .
- [19]. Hu, G., Jousilahti, P., Barengo, N. C., Qiao, Q., Lakka, T. A., & Tuomilehto, J. (2005). Physical activity, cardiovascular risk factors, and mortality among Finnish adults with diabetes. *Diabetes care*, 28(4), 799-805.
- [20]. Guariguata, L., Nolan, T., and Beagley, J. "International Diabetes Federation. IDF Diabetes Atlas." 6th ed. (2013).
- [21]. Midhet, F. M., Al-Mohaimed, A. A., & Sharaf, F. K. (2010). Lifestyle related risk factors of type 2 diabetes mellitus in Saudi Arabia. Saudi medical journal, 31(7), 768-774.
- [22]. LeMone, P. and Burke, K. (2008): Medical-Surgical Nursing, Critical Thinking in Client Care, (4thed.). Pearson Education International: United States of America, pp. 563- 582.
- [23]. Smeltzer, S. C.; and Bare, B. G. (2003): Brunner and Suddarth's, Textbook of Medical-surgical Nursing, (10thed.). Lippincott Williams and Wilkins: Tokyo, pp. 1150-1153.
- [24]. World Health Organization. Body mass index – BMI. 2018. <http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle/body-mass-index-bmi>
- [25]. World Health Organization. Global Strategy on Diet, Physical Activity and Health. 2012. [http://www.who.int/dietphysicalactivity/childhood\\_what/en](http://www.who.int/dietphysicalactivity/childhood_what/en)
- [26]. Kern, R.M. and Belangee, S. (2003): Development of the Objective Assessment of the Lifestyle Construct, available at website: [http://www.education.gsu.edu/cps/faculty/Roy\\_M\\_kern/lecture2.htm](http://www.education.gsu.edu/cps/faculty/Roy_M_kern/lecture2.htm)
- [27]. Lloyd-Jones, R. Adams, M. Carnethon, G. De Simone, T.B. Ferguson, K. Flegal, et al. Heart disease and stroke statistics–2009 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee Circulation, 119 (2009), pp. e21-e181
- [28]. Deshpande, M. Harris-Hayes, M. Schoutman Epidemiology of diabetes and diabetes-related complications PhysTher, 88 (2008), pp. 1254-1264
- [29]. Boule, E. Haddad, G.P. Kenny, G.A. Wells, R.J. Sigal. Effects of exercise on glycemic control and body mass in type 2 diabetes mellitus: a meta-analysis of controlled clinical trials JAMA, 286 (2001), pp. 1218-1227
- [30]. American Diabetes A Standards of medical care in diabetes–2013. Diabetes Care, 36 (Suppl. 1) (2013), pp. S11-S66
- [31]. The University of California San Francisco (2011): Diabetes Mellitus. Available at: [http://www.ucsfhealth.org/conditions/diabetes\\_mellitus/signs\\_and\\_symptoms.html](http://www.ucsfhealth.org/conditions/diabetes_mellitus/signs_and_symptoms.html)
- [32]. Wallace, A. S., Seligman, H. K., Davis, T.C., Schillinger, D., Arnold, C. L., Bryant-Shilliday, B et al. (2009): Literacy-appropriate Educational Materials and Brief Counseling Improve Diabetes Self-management. Patient Education and Counseling; 75 (3). Available at: <http://www.sciencedirect.com/science/article/pii/S0738399108006575>
- [33]. Chen, L., Pei, J. H., Kuang, J., Chen, H. M., Chen, Z., Li, Z. W., & Yang, H. Z. (2015). Effect of lifestyle intervention in patients with type 2 diabetes: a meta-analysis. Metabolism, 64(2), 338-347.

Dr.RahmaAbdElgawad Mohamed Elkalashy. "Effect of educational program on lifestyle for patients with non-insulin-dependent diabetes mellitus. "IOSR Journal of Nursing and Health Science (IOSR-JNHS) , vol. 7, no.6 , 2018, pp. 45-50