Risk factors for Cardiovascular Diseases among Diabetic Patients attending Al Nasiriyha Diabetic and Endocrinology Center

Qasim Ali Khasal[1], Dheyaa Kadhim Jabbar[2], Fatima J Shinjar[3]

[1] Lecturer, Adult Nursing Department, Faculty of nursing, University of Thi-Qar, Nasiriyah City, Iraq,
[2] Lecturer, Community Health Department, Nasiriyah Technical Institute/ Southern Technical University / Iraq,
[3] Assist. Lecturer, Adult Nursing Department, Faculty of nursing, University of Thi-Qar, Nasiriyah City, Iraq

Abstract

Objective: To determine the risk factors for cardiovascular disease among patients with type 2 diabetes.

Methods: The data were collected by utilization of the study instruments and employment of scheduled interview as means data collection. The data collection process was performed from July 2nd / 2019 / October 2nd/ 2019. A questionnaire was designed constructed by the researcher to measure the variable .The questionnaire consisted of3 parts which are demographical, clinical information and risk factors. The reliability of the questionnaire was determined through a pilot study and the validity through a panel of experts. The data were analyzed through the application of descriptive statistic frequency, percentage, and the application of inferential statistical procedures, which include Pearson correlation coefficient, and contingency coefficient.

Results: Results: The result of the study showed that the most common modifiable risk factors were low HDL-C levels (69%), smoking (40%), hypertension (46%), Overweight (57%), high triglycerides (21%), hypercholesterolemia (15%), and high LDLC (12%). All these factors were positively and significantly associated with the development of CVD. Whereas, the most common non-modifiable risk factors were age 50 years and more, sex, family history of CVD .

Keywords: *risk factors ,cardiovascular diseases, diabetic patients.*

Introduction

The International Diabetes Federation (IDF) estimates that worldwide, 415 million people have diabetes, 91% of whom have type 2 diabetes mellitus (T2DM) [1]. People with diabetes comprise 8.8% of the world's population, and IDF predicts that the number of cases of diabetes will rise to 642 million by 2040 [1]. The prevalence of T2DM has been steadily increasing over time. Using data from the Framingham Heart Study, Abraham et al. [2] noted that the overall annualized incidence rates of the disease per 1000 persons increased from 3.0 in the 1970s to 5.5 in the first decade of the 2000s. That change represented an increase in the incidence of T2DM of 83.3% and was higher in males than females by a factor of 1.61. Cardiovascular diseases, i.e. Coronary heart diseases, stroke, and peripheral vascular diseases account for the majority of deaths in diabetic patients (2). Diabetes mellitus, hypertension, cigarette smoking, dyslipidemia, obesity and physical inactivity are established risk factors for cardiovascular diseases (CVD). These risk factors are known as traditional or conventional cardiovascular risk factors (2, 3). The conventional cardiovascular risk factors have

Corresponding Author:
Qasim Ali Khasal.
Adult Nursing Department, Faculty of nursing,
University of Thi-Qar, Nasiriyah City, Iraq;
E-mail: qasem9361@gmail.com

greater impact on diabetic patients than non-diabetics [2, 4]. The multiple risk factors intervention trial (MRFIT) showed the presence of any one, two or all three risk factors (hypertension, cigarette smoking, dyslipidemia) increased the risk of CVD death more in diabetics than non-diabetic men (RR of 4.8, 4.0 and 2.6, respectively) [4]. In view of the growing burden of diabetes and its cardiovascular complications in the developing world, it is crucial to determine the physical and metabolic characteristics of diabetic persons in this part of the world. This study was conducted to assess the prevalence of cardiovascular risk factors among diabetic patients on follow-up at the diabetic clinic of Al Nasiriyha Diabetic and Endocrinology Center.

Material and Method

Design of the Study: A descriptive quantitative design was carried out through the present study in order to achieve the early stated objectives during the period from 8th of January, 2019 to the 5 th of July, 2019.

Administration Arrangement: After getting the approval of the council of Nursing College upon the study, the researcher submitted a detailed description including the objective and methodology (questionnaire) of the study to the Thi-qar Health Directorate (Training and development department) in order to obtain an official permission, and was presented to AL- Diabetic Center ensure their agreement and cooperation .

Setting of the Study : The study was conducted at outpatient clinics in Al Nasiriyha Diabetic and Endocrinology Center, one of these Center is located in An Nasiriyah city, Thi-qar, Iraq.

Al Nasiriyha Diabetic and Endocrinology Center is the only center in Thi-qar that provides diabetic patients with education on insulin self-injection techniques. A follow-up appointment with a clinician, in addition to the low-cost services such as affordability of medications and laboratory tests once every 3–5 months, is commonly provided by this center for every registered diabetic patient.

The Sample of the Study : The Sample of the Study :A non-probability (purposive) sample of (100) patients was selected. All the patients who diagnosed DM and they had a medical records and attending Al -Nasiriyha Diabetic and Endocrinology Center

Ethical consideration: The participants in were verbally informed about the aims of the study and had been asked to participate voluntarily. They also had been informed that they can refuse to answer a certain question or withdraw from the study at any time. Emphasis was placed on creating a relaxed atmosphere during interview through the use of good communication skills with participants.

The Study Instruments : consisted of two major parts constructed for the purpose of the study. Part I: Socio- Demographic Data: It consists of (7) items, related to the Socio-demographic characteristics of these patients which include (age, gender, and occupational status, level of education, marital status, monthly income, and residential area). Part II: Past History: Chronic Diseases (hypertension, diabetes mellitus and others), family history which includes (high blood pressure, diabetes mellitus, and heart disease). Part III: The three part consists of the questionnaire related to risk factors, which includes four sections (diagnosis, past history, smoking and alcohol consumption, BMI measures and biochemical measures). Part IIII: This domain was measured through (3) items of physical activity (1) item, simple exercises such as (curvature, stop, a leisurely walk and Physical relaxation exercises); (1) item; moderate exercises such as (Brisk walking, shopping , move light things) and (1) items, strong exercises (Vigorous exercise) such as (Jogging quickly , running, drive car , lifting heavy objects , exercise). These items were rated and scored by three level types option scale for each type of physical activity as (don't do (1), sometime 1-6 times weekly (2), always 7 or more time weekly (3),. The high score of physical activity domain obtained, it means higher modification by patients.

Three rating scale were used for physical activity and the first of stress management as following

$$= \frac{\text{cut of point}}{\text{no.of scale}} \times 100 = \frac{\text{cut of point}}{\text{no.of scale}} \times 100$$

$$= \frac{2}{3} \times 100 = = \frac{2}{3} \times 100 = 66.6$$

So the interval had been ranged between (66.6-100) that, represented the rate of the lifestyle modification

$= \frac{100-66.6}{3} = 11.1 = \frac{100-66.6}{3} = 11.1$

66.6 + 11.1= 77.7

66.6 to 77.7 is low lifestyle modification

77.7 + 11.1=88.8

77.8 to 88.8 are moderate lifestyle modification

88.8 + 11.1 = 99.9 = 100

88.9 to 100 is high lifestyle modification

In addition less than 66.6 is no effect

Risk factors and positive screens were determined using accepted guidelines to match comparable publications. Obesity was defined as a measured BMI of ≥30 kg/m2.20 Stress was a risk factor if the subject reported being stressed at ≥3 days a week. Alcohol abuse was defined as a male consuming ≥3 drinks/day or a female consuming ≥2 drinks/day.17 A positive screening for hypertension was defined as a systolic blood pressure ≥160 mm Hg or a diastolic blood pressure ≥90 mm Hg. Positive screen for diabetes was a random blood glucose level ≥160 mg/dL.22 Random blood cholesterol ≥200 mg/dL was a positive screen for high cholesterol.

Conducting Pilot Study: Before starting the data collection, a pilot study was conducted on (10) patients who have coronary artery disease for the following purposes:

Determine the reliability of the questionnaire .Estimate the time required for the data collection .Obtain the clarity and the content adequacy of the questionnaire and observation Identify the barriers that may be encountered during the data collection process

Validity: The validity of the instrument was established through a panel of (8) experts. who had more than five years' experience in their fields in order to achieve study objectives.

Reliability: results of the reliability showed very high level of stability and internal consistency of principle parts concerning item's responses' of the questionnaire, all those were calculated by using the major statistical parameter: Alpha Cronbach, revealed that the person correlation coefficient is (0.73).

Statistical Analysis :analysis of the data was employed through the application of the following statistical data analysis approaches: A: Descriptive statistical data analysis: including Percentage , Mean, SD, (Frequency=(F

B: Inferential statistical data analysis.

Result

Table 1: Distribution of Patients with Respect to Patient's History.

Basis Information	**Variable**		**Frequency**	**Percent**
Duration of diagnosis **of diabetic**	**1 – 5 years**		**54**	**54.0**
	6 – 10 years		**5**	5.0
	11 years and above		41	41.0
Patient History	High blood pressure	No	61	61.0
		yes	39	39.0
Mean ± SD			2.19± 1.86	

Cont... **Table 1: Distribution of Patients with Respect to Patient's History.**

Family History	High blood pressure	53	53.0
	Diabetic Mellitus	15	15.0
	High blood pressure& Diabetic mellitus	25	25.0
	No Chronic Disease	7	7.0
	Total	100	100.0
Mean ± SD		1.022± 1.025	

Table 2.Distribution of Patients according to Smoking and Alcohol drinking

Basis Information	**Variable**	**Frequency**	**Percent**
Smoking	Currently smoking	40	40.0
	Previous smoking	25	25.0
	Not Smoking	35	60.0
	Total	100	100.0
Mean ± SD		1.60± 1.99	
Alcohol drinking	Drink Currently	1	1.0
	Previous drinking	1	1.0
	No	98	98.0
	Total	100	100.0
Mean ± SD		1.99± .100	

n= number of samples, F= frequency, %=percentage,

Table 3. Distribution of Patients according to BMI, Blood pressure and blood sugar measures

Basis Information	**Variable**	**Frequency**	**Percent**
Body Mass Index (Kg/m2)	Normal (<25)	20	20.0
	Overweight (25-29.9)	57	57.0
	Obese (30-34.9)	11	11.0
	Obese II (=>35)	12	12.0
	Total	100	100.0
Mean ± SD		2.15± .880	
Blood Pressure	SBP=<140 & DBP<90	45	45.0
	SBP>140 & DBP=>90	55	55.0
	Total	100	100.0

Mean ± SD		1.55± .500	
Blood sugar	Fasting blood glucose level <126mg/dl	28	28.0
	Fasting blood glucose level >126mg/dl	72	72.0
	Total	100	100.0
Mean ± SD		1.72± .451	

n= number of samples, F= frequency, %=percentage, BMI= body mass index, SBP=systolic blood pressure, Diastolic blood pressure, <= less than, > = greater than, Kg= kilogram, m2= meter square

Table 4. Distribution of Patients according to Chemistry Blood Level

Basis Information	**Variable**	**Frequency**	**Percent**
Cholesterol blood level	Normal < 200 mg /dl	63	63.0
	Border line of high risk 200-239.9 mg/ dl	22	22.0
	High risk >=240 mg /dl	15	15.0
	Total	100	100.0
Mean ± SD		1.52± .745	
Triglyceride blood level	Ideal < 150 mg /dl	58	58.0
	Border line of high risk 150-199.9 mg/ dl	21	21.0
	High risk >= 200 mg / dl	21	21.0
	Total	100	100.0
Mean ± SD		1.63± .812	
High Density Lipoprotein (HDL) blood level	High >=40 mg/ dl	69	69.0
	Low < 40 mg /dl	31	31.0
	Total	100	100.0
Mean ± SD		1.31± .465	
Low Density Lipoprotein (LDL) blood level	Normal (<130 mg /dl)	73	73.0
	Risky (130-159.9 mg/dl)	15	15.0
	High risk >= 160mg/dl	12	12.0
	Total	100	100.0
Mean ± SD		1.39± .695	

n= number of samples, F= frequency, %=percentage, >=, less than, <= greater than, HDL= High Density Lipoprotein, LDL= Low Density Lipoprotein, mg/dl= Milligrams per Deciliter

Table (5) Assessment of physical Activity of diabetic Patients according to Mean of Scores and Relative Sufficiency

Items		Not exercise No (%)	Sometimes 1-6 No (%)	Always 7/or more No (%)	M.S	R.S	Score level (Grade)
	The mild physical activity	16 (16)	42 (42)	42(42)	2.26	87.33	Moderate
	The moderate physical activity	18(18)	45(28)	36(36)	2.18	78.66	Moderate
	The strong physical activity	46(46)	40(40)	14(14)	1.68	59.66	Low

Cut of point=2, No= number, %= percentage, M.S=mean of score, R.S= relative sufficiency, low lifestyle modification = 66.6 – 77.7, moderate= 77.8 – 88.8 , high= 88.9 -100

Discussion

The result of the present study has revealed that the prevalence of the smoking is (65%). Even with the diabetic the (40.0 %) of patient were current smokers , and 25% were previous smokers. The report indicates that cigarette smoking increases the risk of coronary heart disease by itself. When it acts with other factors, it greatly increases the risk. Smoking increases blood pressure, decreases exercise tolerance and increases the tendency for blood to clot, (AHA, 2010). (14). Regarding alcohol consumption the present study revealed patient no consume alcohol is (98%). , may be due to our value ,that the alcohol consumption is not continence with Muslim religion so the patient feel embarrassed to say or write. Regarding to the BMI (body mass index) the present study revealed about a third of diabetic patients, their BMI was equal and more than (25-29.9 Kg/m2). Similar result presented by (Ahmed, et al., 2018) (19). who conducted a study to Evaluation of risk factors for cardiovascular diseases among Saudi diabetic patients attending primary health care service. showed an overall prevalence of obesity were (57.7%). This difference in percentage between Iraqi people and other country may refer to high stress from siege and strong army operations through the war for many years. According to biochemistry (Lipid profile) the study shows that (15%) of the diabetic patients had total cholesterol levels of 240mg/dl or more. Significant proportions, (22% of the patients) were on the borderline high-risk levels (200-239 mg/dl). Similar result presented by (Abdosh, , et al., 2019) who conducted a study to Cardiovascular diseases risk factors among adult diabetic patients in eastern Ethiopia. showed an overall prevalence of Dyslipidemia (90.6%) (Table 4). Regarding to the triglyceride level the result of the present study shows that (21.0%) of diabetic patients had a prevalence were 200 mg/dl and more. The result demonstrated physical activity, according to relative sufficiency, the highest relative sufficiency was for mild physical activity such as (A leisurely walk, curvature, prostration), while the lowest relative sufficiency was for strong activity such as (driving, Lifting heavy objects) that means there is no modification related to physical activity. This result may be due to the most (48.0 %) of the diabetic patients. Aged 60 years and more who already cannot do the strong exercise, or may be due the their cultured value In An Nasiriyah city, it is a sham to practice any type of sport when you become an old man may be due to the 22 percent of samples were woman, she usually spends most of time at the home.

Conclusions

In accordance with the results of this study ,the researcher can conclude the following:

1. The most common modifiable risk factors were low HDL-C levels (58%) , smoking (65%) , hypertension (61%), obesity (27%), high triglycerides

(21%), hypercholesterolemia (15%), and high LDLC (12%). All these factors were positively associated with the development of CAD.

2. There is no modification related to physical activity where the relative sufficiency was lowest for strong physical activity than mild physical activity .

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Faculty of nursing and all experiments were carried out in accordance with approved guidelines.

References

1- Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: Estimates for 2000 and projections for 2030. Diabetes care. 2004; 27:2047–2053.

2- Abraham TM, Pencina KM, Pencina MJ, Fox CS. Trends in diabetes incidence: the Framingham heart study. Diab Care. 2015;38:482–487.

3- Powers C. Chapter. Diabetes Mellitus. In: Fauci S, Braunwald E, Kasper L, Hauser L, Longo D, Jameson L, Loscalzo J, editors. Harrison's Principles of Internal Medicine. 17th edition. New York: McGraw Hill Medical Publishing Division; 2007; 2152–2168.

4- Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. Lancet. 2004;364(9438):937–952.

5- Stamler J, Vaccaro D, Neaton D, et al. Diabetes, other risk factors and 12 year cardiovascular mortality for men screened in the Multiple Risk Factor Intervention Trial (MRFIT) Diabetes care. 1993;263:2335–2340.

6- Cowie C, Harris M. National diabetes data group (NDDG), Diabetes in America. second edition. Bethesda, MD: National diabetes information clearinghouse; 1995. Chapter 7: Physical and metabolic characteristics of persons with diabetes; pp. 117–164

7- Henefield M, Koehler C. Impact of the individual components of the metabolic syndrome and their different combinations on the prevalence of atherosclerotic vascular disease in type 2 diabetes: The Diabetes in Germany (DIG) study. Cardiovascular diabeto

8- Rani HS, Madari G, Rao VR. Risk factors for coronary heart disease in type 2 diabetes mellitus. Indian Journal of clinical Biochemistry. 2005;20(2):75–80.logy. 2007;6:13–29

9- Yeweynhareg F, Fikre E. An assessment of the health care system for diabetes in Addis Ababa. Ethiop J Health Dev. 2005;19(3):203–210.

10- Kelemu T, Mengistu A, Mamo Y. Assessment of Distribution of Risk Factors for Chronic Complication of Diabetes among Patients Attending Jimma Hospital Diabetic Clinic. Ethiop J Health Sci. 2005;15(2):187–196

11- The DCCT Research Group, author. Lipid and lipoprotein levels in patients with IDDM. Diabetes Control and Complication Trial experience. Diabetes Care. 1992;15(7):886–894.

12- Roca B, Suarez C, Ceballos A. Control of hypertension in patients at high risk of cardiovascular disease. Oxford Journal of Medicine. 2005;98(8):581–588.

13- Latsabidze N. Novel risk factors in patients with type 2 diabetes mellitus and established cardiovascular disease. Atherosclerosis.2018; 06.299

14- American Heart Association. Heart disease and stroke statistics-2010 update. 2010.

15- Abdosh T, Weldegebreal F. Cardiovascular diseases risk factors among adult diabetic patients in eastern Ethiopia. JRSM Cardiovascular Disease. 2019; 204800401987498

16- Khasal Q, Rashash D. Assessment of Secondary Prevention Regarding Dietary Pattern for Patient with Coronary Artery Disease at Al-Nasiriya Heart Center. Indian Journal of Forensic Medicine & Toxicology. 2019; 13(3): 253.

17- Kilkenny M, Dunstan L. Knowledge of risk factors for diabetes or cardiovascular disease (CVD) is poor among individuals with risk factors for CVD. Plos One. 2017; 12(2).

18- Ahmed A, Alsharief E. Evaluation of risk factors for cardiovascular diseases among Saudi diabetic patients attending primary health care service. Diabetes & Metabolic Syndrome: Clinical Research & Reviews. 2013; 7(3): 133–137.