



# STUDY OF EPIDEMIOLOGICAL FACTORS ASSOCIATED WITH THE OCCURRENCE OF DIABETES MELLITUS DISEASE - TEACHING HOSPITAL (DIABETIC CENTER) GADARIF STATE / EASTERN OF SUDAN -2019

**Dr. Gurashi Gabr Alla Hamad<sup>1</sup>, Omnia salah El Husain<sup>2</sup>, Abrar Salah El Husain<sup>3</sup>**

<sup>1</sup>Assistant Professor- Dean of faculty of public & Environmental Health -West Kordofan University.

<sup>2</sup>Department of Public Health Care -Ministry of Health – Gadarif State -Sudan.

<sup>3</sup>Fculty of medicine – Gezira University

## ABSTRACT

This descriptive study was conducted at teaching hospital (Diabetic Center) Gadarif State / Eastern of Sudan with an aim to study the Diabetes Mellitus (DM) and associated epidemiological factors 2019, .the sample size was 370 patients according to **Richard geiger Formula**, the data were collected by using the following methods, observation, interview, structure questionnaire which distributed for each patient infected with DM disease, the data were analyzed manually using Excel sheets, results depicted as tables and figures. The main result in this study showed that (63%) of the targets Resident in urban area, also reported (6%) were smoking , (12%) stopped and (82%) were not smoking , While (0.3%) were taking alcohol , (5.4%) stopped and (94.3%) not, likewise that it concluded (38% male, 30% female) were normal waist circumference and (62% male , 70% female ) were abnormal ( less & more ) waist circumference. The important recommendation in this study that Raising detection rate for DM disease in Gadarif state by Strengthen of referral system and Activation of mobile clinics and teams investigation, Providing of DM center with more medical equipment's, Raising health awareness for patients and community with regard to DM disease.

**KEYWORDS:** descriptive study, Eastern of Sudan, epidemiological factors, Diabetes Mellitus.

## 1. INTRODUCTION

Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin (a hormone that regulates blood sugar) or alternatively, when the body cannot effectively use the insulin it produces .

The classification of diabetes was originally limited to only two categories called :

**Type 1** diabetes is characterized by a lack of insulin production.

**Type 2** diabetes results from the body's ineffective use of insulin<sup>(1)</sup> .

The metabolic abnormalities of diabetes result from inadequate insulin action on target tissues, due to deficient insulin secretion or insensitivity to insulin action, or a combination of both<sup>(2)</sup> . The signs and symptoms of diabetes are disregarded by many because of the chronic progression of the disease. People do not consider this as a serious problem because unlike many other diseases the consequences of hyperglycaemia are not manifested immediately. People are not aware that damage can start several years before symptoms become noticeable<sup>(3)</sup> . One such study is DiPiS(Diabetes Prediction in Skåne), which is examining a total of about 10 000 pregnancies expected every year in the Skåne (Scania) region of Sweden that has 1.1 million inhabitants<sup>(4)</sup> . Diabetes mellitus should not be managed based on symptoms alone. Glycaemic goals are based on evidence of what glucose levels constitute a risk for developing complications. It is, however, inappropriate to aggressively approach target glucose levels when it may adversely affect the patient<sup>(5)</sup> .



The goal of treatment of diabetes mellitus is to control blood glucose and ultimately prevent long-term complications, as shown by major diabetes studies like the United Kingdom Prospective Diabetes Study group and Diabetes Control and Complications Trial<sup>(6)</sup>. The backbone of diabetes management is proper diet and regular exercise, which have to be individualized<sup>(7,8)</sup>.

Before starting any exercise program, the health provider should do a thorough physical examination to find out whether or not it is safe for the patient to exercise<sup>(9)</sup>. In the Eastern Mediterranean Region, some studies have reported that the occurrence of clinical events related to coronary artery disease are four times higher in patients with diabetes<sup>(10,11)</sup>. Many factors that predispose non-diabetic individuals to atherosclerosis are also associated with atherosclerosis in people with diabetes.

These factors include smoking, hypertension and hypercholesterolemia<sup>(12)</sup>.

## 2. OBJECTIVE OF THE STUDY

The study aimed to determine epidemiological factors associated with the occurrence of Diabetes mellitus such as (nutrition , genetics ) status .

## 3. METHODOLOGY

### 3-1 Study Design

This study is a descriptive facility- based / cross\_sectional study.

### 3-2 Study Are :

#### 3-2-1 Gadarif State

Gedarif state cover 75.000 Km2 and lies between latitude 14-16 north and 33-36 E longitude . It is apart of eastern region.

#### 3-2-2 Gadarif Diabetic Center

- GDS west to gadarif teaching hospital and blood bank near to railway police department.
- It provide health service to large number of DM patient in Gadarif State and nearby states.
- The center building composed of one flower divided to 2 clinics , lab , nutrition department , psychological department ,counseling unit , operation hall , pharmacy , foot care office, patients waiting hall , financial issues office , counter hall administration office and 8 path rooms.
- The staff cadres of the center is about (67) person divided to : Diabetologist , Director general, Medical Director, Administrative manager
- doctors, lab technician, nurses , nutritionist, Pharmacist, Cleaning worker, statistical,...
- The center open daily from 7am to 2pm except Friday.
- The daily number of ranging between 200 – 250 in all department
- So The monthly number of patient who visit the center almost about 5200-6500.

### 3-3 Study Population

- The population of Gadarif state is about (2108468) different ethnic groups, most of them are farmers and the others are working in grazing and commerce.
- Most of the population of 90% is Muslims& about 10% of Christians.

### 3-4 Sampling and Sample Size:

$$N = \frac{\left( \frac{Z}{d} \right)^2 \times (0.50)^2}{1 + \frac{1}{n} \left( \left( \frac{Z}{d} \right)^2 \times (0.50)^2 - 1 \right)} \quad \text{(Richard geiger)}$$

### Where:

N = Sample Size

Z = the value of the standard normal variable corresponding to % level of significance (1.96).

D = marginal error (0.05)

### 3-5 Data collection technique:



**3-5-1** structure questionnaire which distributed for each patient infected with DM

**3-5-2** Interview with Diabetologist and deputy general manager.

**3-6 Data Analysis:**

Data was analysis by using computer software (the manual – Excel sheet ) and result table and figures.

**3-7 Ethical Consideration**

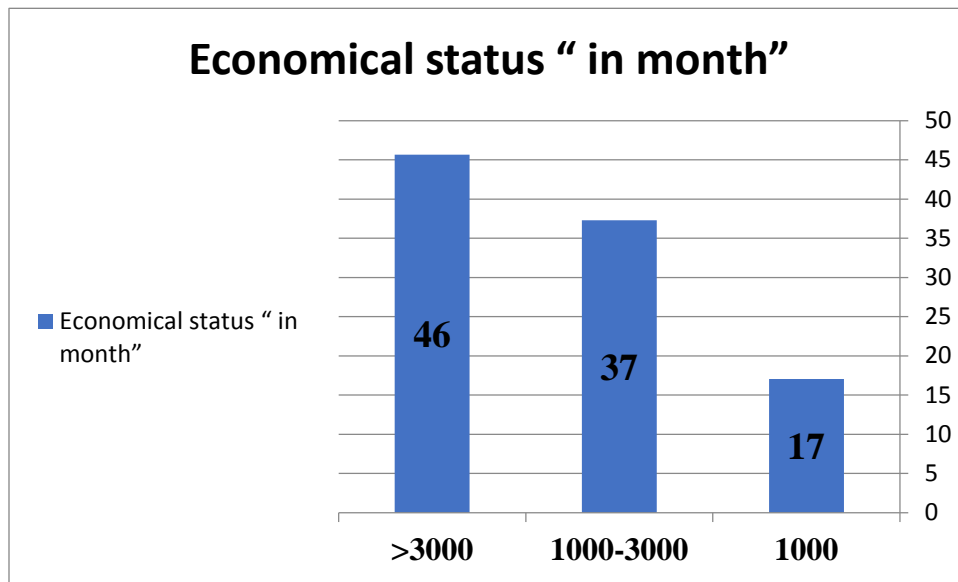
- Permission was taken from Gadarif ministry of health and social development.

\_Strict confidentiality regarding patients information ,such as name, full residential address, was considered.

**4. RESULTS**

**Table (1): distribution of cases according to the Residence (n=370)**

Residence	Frequency	Percent
Urban	232	63
Rural area	138	37
<b>Total</b>	<b>370</b>	<b>100</b>



**Figure(1) : Percent of cases according to the Economic status per month (n=370)**

**Table (2): distribution of cases according to the get Diabetes Mellitus (n=370):**

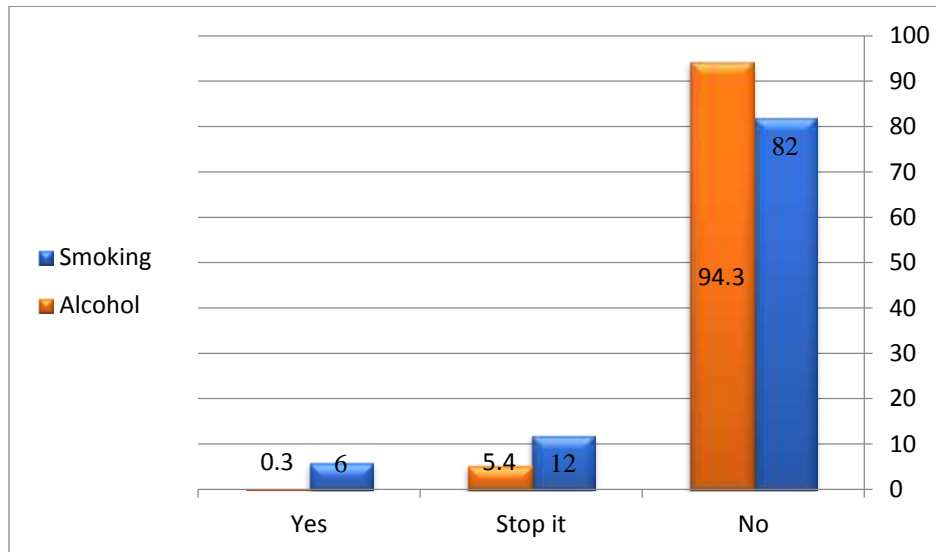
get Diabetes Mellitus	Frequency	Percent
Inherited	166	45
During pregnancy	14	4
Inherited and During pregnancy	6	2
I don't know	161	43
Others	23	6
<b>Total</b>	<b>370</b>	<b>100</b>



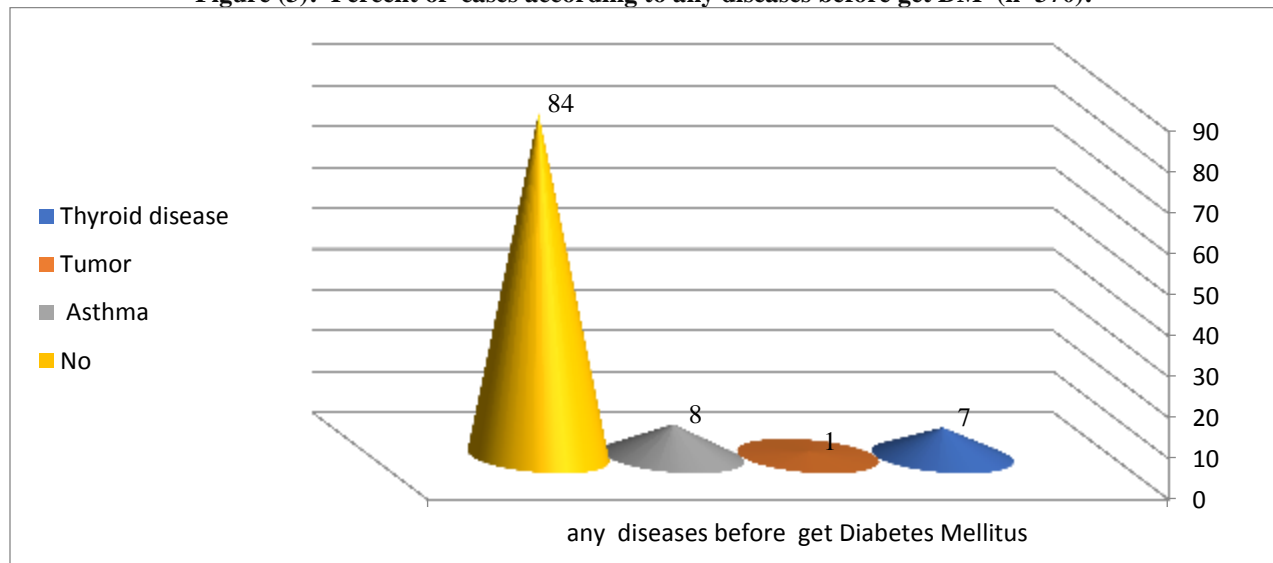
**Table (3): distribution of cases according to the Waist circumference in centimeters (n=370):**

Gender	> normal	normal	< normal	Total
Male	34	40	31	105
Female	145	81	39	265
<b>Total</b>	<b>179</b>	<b>121</b>	<b>70</b>	<b>370</b>

**Figure (2): Percent of cases according to Smoking and Alcohol abuser (n=370):**



**Figure (3): Percent of cases according to any diseases before get DM (n=370):**



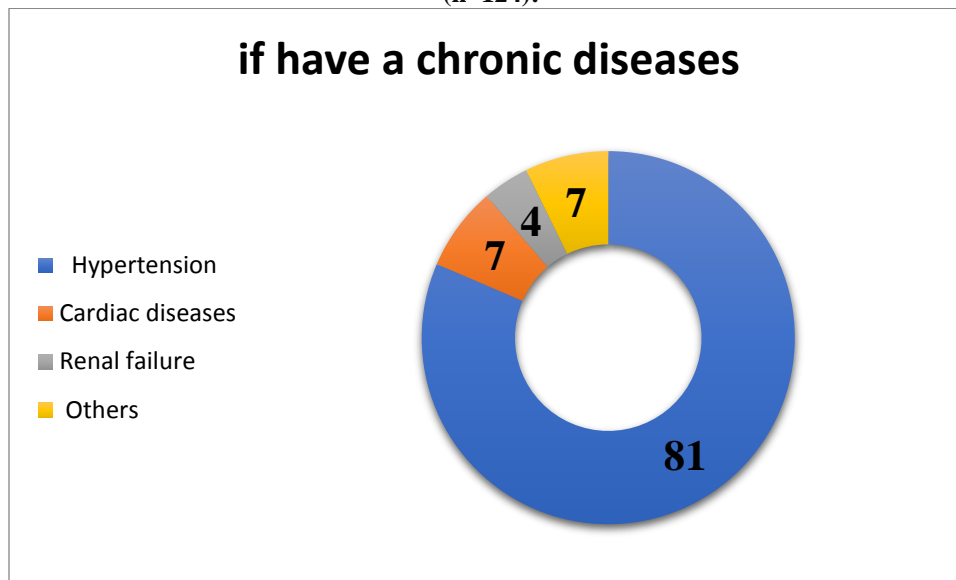
**Table (4): distribution of cases according to the psychological problems (n=370):**

psychological problems	Frequency	Percent
Yes	92	25
<b>No</b>	<b>278</b>	<b>75</b>
<b>Total</b>	<b>370</b>	<b>100</b>

**Table (5): distribution of cases according to the any chronic diseases (n=370):**

any chronic diseases	Frequency	Percent
Yes	124	34
<b>No</b>	246	66
<b>Total</b>	<b>370</b>	<b>100</b>

**Figure (4): Percent of cases according to have chronic diseases (n=124):**



## 5. DISCUSSION

This Study was conducted at teaching hospital (Diabetic Center) Gadarif State / Eastern of Sudan in 2019.

The study aimed to identify epidemiological factors of diabetic mellitus (DM) patients.

The study indicated that (63%) of the targets Resident in urban area, while (37%) Resident in rural area. Zimmet P and others 2001<sup>(13)</sup> They said: (The diabetes epidemic has been attributed to urbanization and environmental transition leading to sedentary behavior and overnutrition).

The study confirmed about (54%) of the targets have low income That means these patients living below poverty line .(according to World Bank about 1.5 USD/day)

The study confirmed (45%) get D.M with inherited ,(4%) were during pregnant ,(2%) inherited and during pregnant ,(43%) I don't know and (6%) others ,While previous study conducted in University Hospital, in Montes Claros, state of Minas Gerais, Brazil /2015, by researchers (Ellen FernandS FlÁVio SilVa<sup>(14)</sup>) has indicated (55.8%)were have family history .

The study reported that (38%male, 30%female) were normal waist circumference and (62% male , 70% female ) were abnormal ( less & more ) waist circumference

The study reported (6%) were smoking , (12%) stopped and (82%)were not smoking , While (0.3%) were taking alcohol , (5.4%) stopped and (94.3%) not, \ Compare with previous study conducted in Kumasi/ Ghana-2012,by researchers(Agbogli H. K and others<sup>(15)</sup>) has indicated to: (34.5%) were smoking , (65.5%) were not smoking, While (4.4%) taking alcohol and (95.6) non .

The study indicated about (25%) were infected with chronic diseases , While (75%) were not infected .

## 6. CONCLUSION

The present study reveals that various demographic, socioeconomic and genetic factors play a vital role in the etiology of diabetes mellitus disease.



Most important factor found were young age group, female gender, low socioeconomic status, low education standard and low physical activities exposure to DM infected patients, obesity and co-existing immune-compromised disease.

Hence this study provides useful information about the epidemiological factors for DM disease that can used to control disease by preventing these potential risk factors in population and timely diagnosis and providing treatment for DM.

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