

## Diabetes Mellitus Risk Factors and Awareness among patients with Type II Diabetes Mellitus Disease in Al-Noaman General Hospital in Baghdad City - 2014

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### Abstract

**Background:** Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces.

Hyperglycemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels.

**Objectives :** 1. To assess the trends of risk factors in patients with type (II) Diabetes Mellitus.

2. To assess the awareness of patients with type (II) Diabetes Mellitus.

3. To assess the Dietary Pattern of patients with type (II) Diabetes Mellitus.

**Method:** A Cross sectional descriptive study with convenience non probability sampling had been carried out during the period between February- June, 2014 that (160) available patients in AL-Noaman hospital in Baghdad city were interviewed.

**Results:** The study showed that most of patients were above 60 years of age with average income, low education & had the disease for more than 5 years. Females formed 62% of those involved patients. For other risk factors half of them were still smokers, 62.5% were with family history of the disease, half of patients had hypertension, quarter of them had heart failure & small part of them had renal failure & ischemic heart disease. For the average mean of blood cholesterol was 259 mg/dl, SD  $\pm$  83.55, (CI 275.38- 242.62) p value < 0.05 while average mean of triglycerides was 212 mg/dl, SD  $\pm$  29.31, (CI 217.75- 206.25) p value < 0.05 & average of body mass index (BMI) was 34. For knowledge & awareness about the disease half of patients knew it by having frequent hunger, thirst & less by frequent urination, blurred vision & others discovered it accidentally. For risk factors quarter of them said that it occurred due to family history of the disease, others said that it occurred due to lack of exercise, obesity, diet, heart disease while half of them didn't know about them & most of them didn't know about the complications of the disease. - More than half of them said that sugar & sweets should be avoided, others said that should avoid all carbohydrates & oil while half of them said that should avoid pregnancy for diabetic females & the same said that could skip treatment when the level of blood sugar has been controlled. - For checking of blood sugar, 50% said that should be checked weekly & others said should be checked monthly.

-More than half of them had their knowledge from relatives while only small part of them had their knowledge from medical staff & there was significant association between awareness & education that  $\chi^2 = 40$ , P value = 0.005. - For dietary pattern the study showed that half of them had good & average intake of red meat & more for chicken while 80% with poor intake of fish. more than half of patients had average intake of full cream milk, full cream cheese while reached to 70% with good & average intake of yogurt. for egg half of them had boiled & others had fried eggs daily. For carbohydrate most of them had eaten white bread and the same had eaten rice with oil daily while only 20% had brown bread daily. Half of them had good & average intake of fresh vegetables & more for cooked vegetables. Half of them had average & poor intake of apple & banana while for orange 60% had poor intake. Most of them took of tea with sugar & less for coffee with sugar.

**Conclusion:** most of patients were with poor awareness about the disease & still has high risk factors and most of medical tips were from relatives with poor application of these tips and didn't follow a healthy lifestyle & dietary pattern..

**Key Word :** Diabetes Mellitus type II, risk factors, awareness, Dietary Pattern

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## Introduction:

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces <sup>(1)</sup>. Hyperglycaemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels. In 2012, an estimated 1.5 million deaths were directly caused by diabetes that more than 80% of diabetes deaths occur in low- and middle-income countries <sup>(2)</sup>. In 2014 the global prevalence of diabetes was estimated to be 9% among adults aged over 18 years <sup>(3)</sup>. By WHO diabetes will be the 7th leading cause of death in 2030 <sup>(4)</sup>. Healthy diet, regular physical activity, maintaining a normal body weight and avoiding tobacco use can prevent or delay the onset of type (II) diabetes <sup>(5)</sup>.

There are 3 types of diabetes as type 1 that is known as insulin-dependent-juvenile diabetes which is characterized by deficient insulin production and requires daily administration of insulin with unknown cause, the symptoms include excessive excretion of urine (polyuria), thirst (polydipsia), constant hunger, weight loss, vision changes and fatigue, while type 2 diabetes that called non-insulin-dependent or adult-onset which results from the body's ineffective use of insulin that comprises 90% of people with diabetes around the world <sup>(5)</sup>, that largely results from excess body weight and physical inactivity and symptoms may be similar to those of Type I diabetes, but are often less marked, as the result, the disease may be diagnosed several years after onset, once complications have already arisen,

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recently, this type of diabetes was seen only in adults but it is now also occurring in children <sup>(5)</sup>.

3<sup>rd</sup> type is gestational diabetes which occurs during pregnancy, that the women are at an increased risk of complications during pregnancy and at delivery and are also at increased risk of type (II) diabetes in the future <sup>(5)</sup>. Impaired glucose tolerance and impaired fasting glycaemia are intermediate conditions in the transition between normality and diabetes that the People are at high risk of progressing to type (II) diabetes <sup>(6)</sup>. Over time, diabetes can damage the heart, blood vessels, eyes, kidneys, and nerves that increases the risk of heart disease and stroke that 50% of people with diabetes die of cardiovascular (macro vascular involvement) diseases <sup>(6)</sup> while peripheral neuropathy in the feet increases the chance of foot ulcers, infection, also patient suffers from diabetic retinopathy which is an important cause of blindness that 1% of global blindness can be attributed to diabetes <sup>(7)</sup>, diabetes is the leading cause of kidney failure (micro vascular involvement) <sup>(8)</sup>. The overall risk of dying among people with diabetes is at least double the risk of their peers without diabetes <sup>(4)</sup>. The risk of stroke is increased by 150% to 400% for patients with diabetes, while the risk of stroke-related dementia increases by more than 3 fold, even though controlling blood sugar treating high blood pressure and dyslipidemia is as important to prevent cerebro - cardiovascular complications in diabetic patients is needed <sup>(9)</sup>. The risk factors associated with type II diabetes can be grouped into two categories: modifiable and non-modifiable risk factors.

Modifiable risk factors include diets rich in saturated fats and simple carbohydrates, impaired glucose tolerance, metabolic syndrome, high blood pressure ( $\geq 140/90$  mm Hg), elevated plasma triglycerides ( $\geq 250$  mg/dl), and low levels of physical activity ( $< 3$  times a week).

The non-modifiable risk factors are age (older than 45 years), family history of diabetes, ethnicity, and diabetes during a previous pregnancy<sup>(10)</sup>.

The diagnostic criteria for diabetes as established by the WHO that include the use of glycated hemoglobin (HbA1c) as a diagnostic criterion for diabetes, with HbA1c values  $\geq 6.5\%$  being diagnostic<sup>(11)</sup>. People with impaired fasting glucose (100–125 mg/dl (5.6–6.9 mmol/L)), and those with impaired glucose tolerance (at or above 140 mg/dl (7.8 mmol/L) but not over 200 mg/dl (11.1 mmol/L)), and with an HbA1c levels ranging between 5.7–6.4% are considered pre diabetic and are at considerable risk for developing diabetes mellitus as well as cardiovascular diseases<sup>(12)</sup>.

It is interesting to highlight that 35 out of 219 countries (16% of the total) has very high prevalence of diabetes, over 12%. These countries are located mainly in Western Pacific, and Middle East and North Africa regions. In Africa is the region with the lower prevalence of diabetes (4.9%), in Seychelles (12.1%) and Gabon (10.7%), while Turkey the prevalence of diabetes is 14.9%, in Saudi Arabia (23.9%), Nauru (23.3%), Kuwait (23.1%) and Qatar (22.9%) then in Iraq the prevalence is 10.2%<sup>(11, 13)</sup>

#### Methodology:

**Study design:** A Cross sectional descriptive study with convenience non probability sampling had been carried out in AL-Noaman hospital in Baghdad city during the period between February- June , 2014 that (160 ) available patients in AL-Noaman hospital were interviewed .

#### Population & Sample size :

An interview questionnaire had been used to all patients with type (II) Diabetes Miletus who attended to the hospital mentioned above .The interview continued consequently till reached the sample size (convenience non probability sampling).

The sample size had been estimated according to the prevalence of Diabetes Miletus that forms 9.3% in Iraq<sup>(14)</sup> with using confidence interval at level of 95% .

the equation of the sample size is ;

$$N = \frac{(1.96)^2 \times P(1-P)}{(0.05)^2} \quad (15)$$

that the sample size of male & females patients with Diabetes Miletus should be 71-80 & could be increased that considered 160 patients .

- An interview questionnaire form had been designed by researcher that bases on:  
1. Demographic characteristics & risk factors that include age, gender, education , marital and job status, type (II) Diabetes Miletus , family history of Diabetes Miletus, history of other diseases ,obesity, hyperlipidemia, smoking status , exercise , stress .

2. Awareness of the disease :

- Has any knowledge about signs & symptoms of Diabetes Miletus.
- Has any knowledge about control of risk factors as control of obesity , cessation smoking , healthy diet , do some type of sport.
- Has any knowledge about complications.
- Can skip the medications when the blood glucose is not too high.
- If knowing diet should be avoided-should avoid pregnancy in women with diabetes
- If checking for fasting blood sugar , random blood sugar, cholesterol tests , eye and renal function.
- source of knowledge.

3. Dietary pattern & Habits of drinking Tea with sugar will be rated by frequency distribution table as ; Dividing the food

parts according to their groups as meat group , milk group , seed group ,vegetable group , fruits , legumes , nuts , other source of fat & sugar , then evaluate the times of intake for each food item for each group and consider a good dietary pattern when there is daily intake or more than 4 times/ week for each food item , average dietary pattern when there is 2-3 times / week intake each of food item while consider poor dietary pattern when intake of food item is less than 2 time / week <sup>(16)</sup>.

**Inclusion Criteria :** - age as over 40 years , gender as male & female , education , type (II) D.M disease , smoking status , risk factors

**Exclusion Criteria :** alcohol intake, type (I) D.M , pregnant females,  
**Body Mass Index (BMI) :** For calculating Body Mass Index , body height and weight will be measured for participants and by using the equation = weight (kg) / height ( m<sup>2</sup>) , that regards BMI of less than 18.5 as underweight and may indicate malnutrition, an eating disorder, or other

health problems, while a BMI greater than 25 is considered overweight and above 30 considered obese<sup>(17)</sup> analyses : Data was analyzed by using Statistical tests as Proportions, Measurement of Variability , X<sup>2</sup> with consider the Confidence Interval at level of 95% .

### Results:

- Table 1 showed socio demographic characteristics that 43.75% of patients were above 60 , 34.25% were between 50-60 , 22% were between age 40-50 years . Females formed 62% while males formed 38% of the study.

- For occupation : retired ,workers , and clerks represented 30% for each & 10% were without work.

- For education : 25% of patients were illiterate , same for primary , secondary education & graduation . For duration of the disease 13% had the disease below one year ,19% more than one year & 63% for more than 5 years .

Table (1) Distribution of patients according to socio demographic characteristics

1. Age	Number of patient	%
41-50 years	35	22%
51-60 years	55	34.25%
≥ 61 years	70	43.75%
Total	160	100%
2. Sex	Number of patient	%
Males	60	37.5%
Females	100	62.5%
Total	160	100%
3. Education	Number of patient	%
Illiterate	40	25%
1 <sup>st</sup> school	40	25%
2 <sup>nd</sup> school	40	25%
Gradated	40	25%
Total	160	100%
Occupation	Number of patient	%
Retired	48	30%
Workers	48	30%
Clerks	48	30%
Without work	16	10%
Total	160	100%

Table 2 showed risk factors that 62.5% were with family history of the disease , for other diseases 50% had hypertension , 25% had heart failure , 12.5% had renal failure & ischemic heart disease respectively .

For the average mean of blood cholesterol it was 259 mg /dl, SD  $\pm$  83.55 ,

(CI 275.38- 242.62) p value < 0.05 while average mean of triglycerides was 212 mg /dl , SD  $\pm$ 29.

31, (CI 217.75- 206.25) p value <0.05& average of body mass index (BMI) was 34 , 75% with physical inactivity & 50% were still smokers.

Table (2) Distribution of patients according to their risk factors

Risk factors	Number of patients	%
1. Family history	100	62.5%
2. Other disease		
a. Hypertension	80	50%
b. Heart failure	40	25%
c. Renal failure	20	12.5%
d. Ischemic heart disease	20	12.5%
3.smoking cigarette	80	50%
4. physical inactivity	120	75%
5. Average of Lipid profile		
a. cholesterol		259mg g/dl
b. triglyceride		212mg/dl
6. Average of Body mass index		34

Table 3 showed knowledge and awareness of diabetes that 50% of patients knew the disease by having frequent hunger & thirst , 25% by having frequent urination ,12.5% by having blurred of vision & or discovered accidentally respectively .

- For knowing of risk factors of the diabetes mellitus , 25% said that due to have family history of the disease ,10% said due to lack of exercise , obesity , diet , heart disease respectively while others didn't know about them. 75% didn't know about the complications of the disease . About the knowledge of the diet that

should be avoided , 60% said that sugar & sweets should be avoided , 25% all carbohydrate , 12.5% said that oil should be avoided , 50% of patients said that should avoid pregnancy for diabetic females & the same said that can skip treatment when the level of blood sugar has been, controlled , for checking of blood sugar 50% said that should be checked weekly & others said should be checked monthly that more than half of those patients had their knowledge from their relatives & friends that reached 62.5% while knowledge from medical staff reached 37.5% .

Table (3) Distribution of patients according to their knowledge and awareness of diabetes

1. knowing of Symptoms	Number of patients	%
a. excessive thirst & hunger	80	50%
b. excessive urination	40	25%
c. blurred of vision	20	12.5%
d. accidentally	20	12.5%
Total	160	100%
2. knowledge about risk factors		
a. family history	40	25%
b. obesity	40	25%
c. diet	16	10%
e. lack of exercise	16	10%
f. All of them	48	30%
Total	160	100%
3. knowledge about diet should be avoided		
a. sugar& sweets	80	50%
b. carbohydrate	40	25%
c. oil	40	25%
Total	160	100%
4. can skip treatment : Yes	80	50%
No	80	50%
Total	160	100%
5. avoid pregnancy : Yes	80	50%
No	80	50%
Total	160	100%
6. knowledge about complications:		
; Yes	80	50%
: No	80	50%
Total	160	100%
6. from where get knowledge		
a. Medical staff	60	37.5%
b. Relatives & friends	100	62.5%
Total	160	100%

(Table 4) showed significant association between awareness & education = 40 , P value =0.005

Table (4) association between Awareness &amp; Education

Education	Awareness		No awareness		Total
Illiterate	10	6.25%	30	18.75%	40
Primary	10	6.25%	30	18.75%	40
Secondary	20	12.5	20	12.5%	40
Graduated	40	25%	0	----	40
Total	80	50%	80	50%	160

$X^2 = 40$  ,  $df = 3$  ,  $P \text{ value} = 0.005$  , statistically significant

- Figure (1) showed dietary pattern of meat group that half of the respondents had good & average intake of red meat , 60% had good & average intake of chicken while & 80% had poor intake of fish.

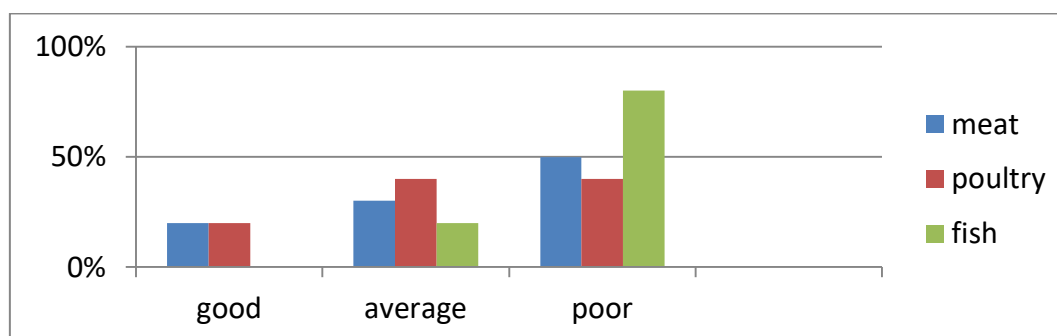


Figure (1) dietary pattern of meet group

- Figure (2) showed dietary pattern of milk group that 60% had average intake of full fat milk but 60% with good & average intake of full cream cheese while 70% had good & average intake of yogurt . for egg 50% had of boiled eggs & the same had i fried eggs daily.

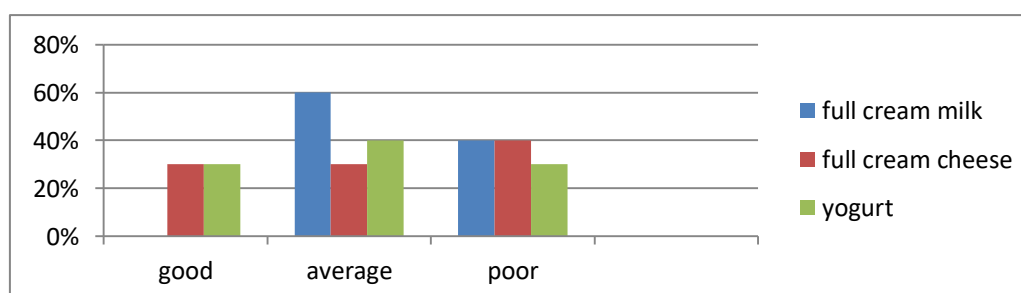


Figure (2) intake of milk &amp; products

Figure (3) showed dietary pattern of carbohydrate that 80% had intake white bread and & the same had rice with oil daily while only 20% had brown bread daily . For legumes 100% had fava & lentos with oil monthly.

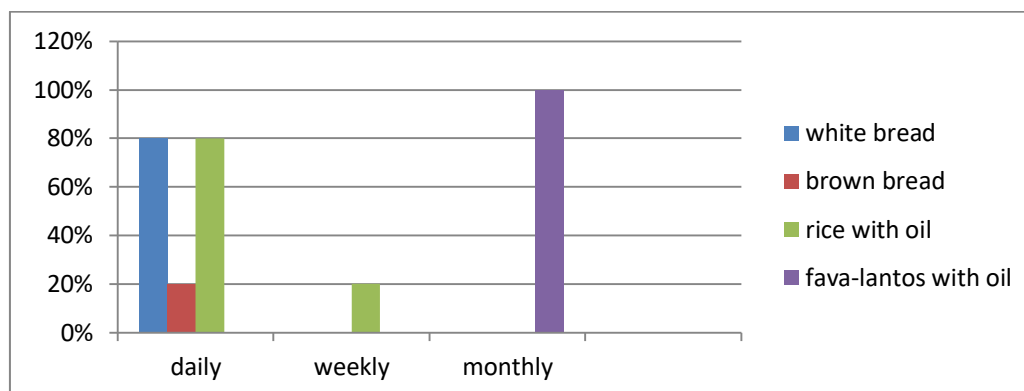


Figure (3) percentage of intake of starch & legumes

Figure (4) showed dietary pattern of vegetables that half of them had fresh vegetables daily & weekly & increased to 60% daily & weekly for cooked vegetables.

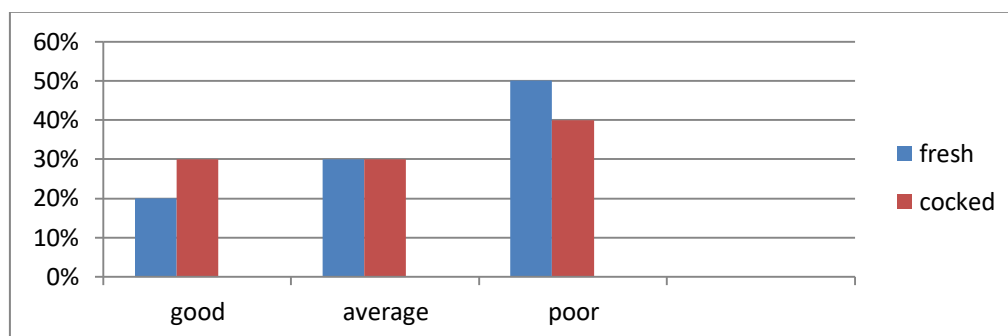


Figure (4) percentage of intake of vegetables

Figure (5) showed dietary pattern of fruits that half of them had average & poor intake of apple & banana & reached to 40%,60% as average & poor intake of orange .

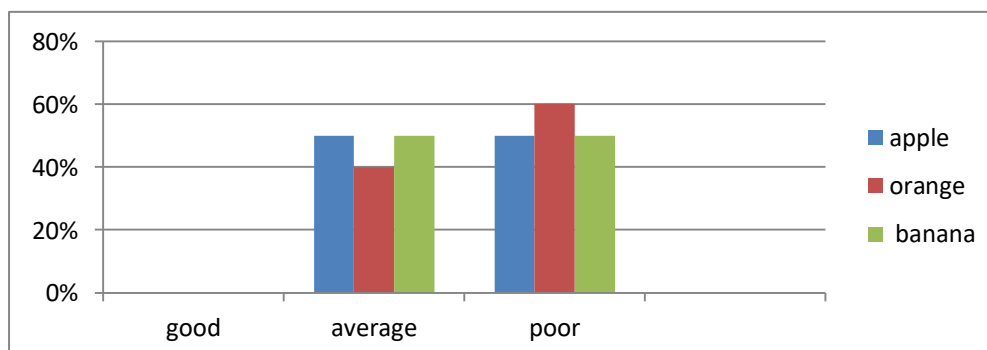


Figure (5) percentage of intake of fruit

Figure (6) showed intake of tea & coffee that most of them took tea with sugar & less for coffee that reached to 40%

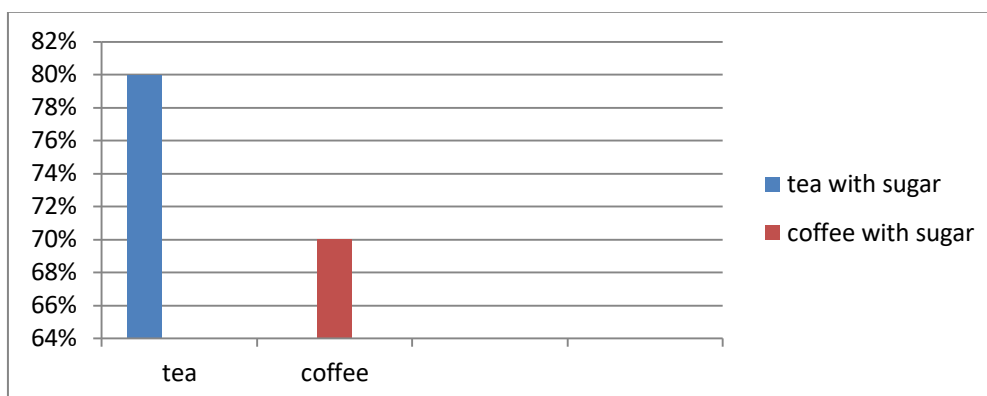


Figure (6) percentage of intake of tea & coffee

## Discussion :

Most of patients were females & over forty that had suffered from the disease for more than five years & mostly occurred among low education & an average & low income which was consistent with previous studies <sup>(10)</sup>, the rate of type II diabetes in the low socioeconomic status population in urban areas in Egypt is 13.5%, which contrasts with a higher population in urban areas of Lebanon that has a prevalence of 20% <sup>(15)</sup>.

For the risk factors, half of them had hypertension & more with family history of the disease & part of them with other disease as heart failure, ischemic & renal failure. Still has high average mean of blood cholesterol, triglycerides, high body mass index with physical inactivity, these risk factors still higher than the internationally recognized that consistent with recent studies <sup>(11)</sup>. Sedentary lifestyle increases the risk of developing type II diabetes and obesity <sup>(18)</sup>. A study from the United States documented the relationship between physical activity, TV watching and the incidence of type II diabetes; the least active men who watched TV more for than 15 hours per week had a significantly

increased risk of type II diabetes (R R = 2 . 9 2 ) compared to men with high activity and less TV watching.

A Kuwaiti study reports that 58% of subjects with type II diabetes were physically inactive compared to 4% who were active <sup>(18)</sup>. Cultural barriers and limited access to sporting/exercise facilities are significant deterrents to engaging in physical activity in women of the Middle Eastern / North African region. Several randomized clinical trials confirm that diet and exercise can decrease the incidence of type II diabetes. The Da Qing Diabetes Prevention Study in China reports, that had a 6-years follow-up period reported, that only 47% of the patients in the diet plus exercise group had type II diabetes, while 68% of patients in the control group were diabetic; diet and exercise alone produced a 42% risk reduction for developing type II diabetes <sup>(19)</sup>. There was poor awareness of patients which was highly associated with education that the level of education allows increased awareness about type II diabetes as risk factors, complications and management and lifestyle choices <sup>(20)</sup>. A study of 3003 diabetic patients in Kuwait

reported that 27.5% of diabetic patients were illiterate, while 15.5% were better educated <sup>(20)</sup>, similar findings were reported in Jordan and Qatar, where type II diabetes prevalence among the illiterate population was 34% and 23.5%, while among the university educated group was 7.7% and 11.3%, respectively <sup>(21) (22)</sup>.

More than half of patients were smokers, it has been proven worldwide smoking is one of the main reasons for chronic diseases <sup>(23)</sup>.

For dietary pattern the study showed that too much intake of carbohydrate as most of them had consumed white bread & rice with oil & there was high intake of fat, whether through milk and milk products or with cooking, while the kind of food for diabetic patients suggests reducing carbohydrate & fat, also noted there was lack of eating of fish, poor intake fruits and vegetables, there was much intake of tea and coffee with sugar, this is consistent with dramatic dietary changes, going from predominantly consuming dates, low fat milk, fresh vegetables and fruit, whole wheat bread and fish to now mostly consuming foods rich in high saturated fats and refined carbohydrate diets coupled with a low dietary fiber intake <sup>(24)</sup>. These changes in dietary habits are associated with rising in the prevalence of chronic diseases and obesity in the region <sup>(25) (26)</sup>. In a recent study from Saudi Arabia, the adjusted odds ratio for eating Kabsa (a meal containing rice and meat) was 5.5, while that for vegetables was only 0.4 <sup>(27)</sup>.

## Conclusion:

Most of patients were with poor awareness about the disease & still has high risk factors and most of medical tips were from relatives with poor application of these tips and didn't follow a healthy lifestyle & dietary pattern.

## Recommendations:

There is an urgent need for comprehensive studies on the role of these factors and their contribution in the occurrence of type II diabetes.

There to be continues & adequate public awareness of healthy eating habits and of the interactions of diet, exercise, and chronic diseases. It would be particularly important to develop programs for early-age exercise programs and nutrition education, regardless of regional or gender issues since Arabic countries suffer from poor exercise, which is probably the main reason for such high diabetes and obesity prevalence.

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