

## Knowledge and Practices among Diabetic Clients Regarding Cardiovascular Problems in A Rural Area

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### ABSTRACT

**Introduction:** It is now well established that type2 diabetes is part of the metabolic or insulin resistance syndrome, which comprises hypertension, dyslipidemia, central adiposity and cardiovascular disease. **Aim:** The study aims to assess the knowledge and practices among diabetic' clients regarding cardiovascular problems in a rural area. **Design:** A descriptive study was used. **Setting:** This study was conducted at diabetic' outpatient clinics at Kafr El-sheikh General Hospital. **Sampling:** A purposive sample of 100 diabetic clients. **Tools:** Two tools were used for data collection. **First tool:** Was an interviewing Questionnaire, this tool was divided into three parts for collecting data. **Part one:** it was concerned with date related to socio-demographic characteristics of the Diabetic Clients. **Part two:** It was concerned with client's past and present health history as duration of illness, symptoms, investigations, and medications. **Part three:** It was concerned with clients' knowledge regarding diabetes mellitus and cardiovascular problems. **Second tool:** Checklist to Assessing diabetic clients' practices regarding diabetes mellitus and cardiovascular problems. **Results:** The results of this study indicated that, the majority of diabetic clients were females and their age ranged from 45- 50 years, almost were illiterate and were living in not crowded homes. The highest portion their duration of diabetes were 4:5 years period. More than half of studied samples had family history of diabetes. The majority of study sample treated with insulin. The minority of them their Practices were correctly done for hypoglycemia and hyperglycemia control. A large proportion of diabetic clients have poor knowledge and practices regarding diabetes mellitus and cardiovascular problems. **Conclusion:** The study concluded that there was no statistical significant association between socio-demographic characteristics of diabetic clients' knowledge and their practices. As well there was statistical significant association between diabetic clients' knowledge and their practices. **Recommendations:** The study recommended that extensive health education and health promotion programs are recommended to prevent diabetic complications.

**Key words:** diabetes mellitus, cardiovascular disease, Knowledge and Practice.

### INTRODUCTION

Diabetes mellitus is a group of endocrine-metabolic disorder with multiple etiologies which characterized by elevated levels of glucose in the blood

(hyperglycemia) resulting from defects in insulin secretion, insulin action, or both, characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of different

organs, especially the eyes, kidneys, nerves, heart, and blood vessels (**Richard et al., 2010 & WHO, 2014 & Tahseen, 2014**).

The prevalence of type 2 diabetes is increasing worldwide. Approximately 285 million people worldwide have diabetes in 2010, making it one of the most common non-communicable diseases globally. The aging population, with an increase in the proportion of people aged over 65 years in most countries, has contributed significantly to this increase in prevalence. The increase in diabetes prevalence is likely to lead to an escalation of health care costs and loss of economic growth (**Richard et al., 2010 & IDF, 2014**).

According to the International Diabetes Federation (**IDF**), report (2013). Diabetes is a silent disease, many suffer become aware that they have diabetes only when they develop one of its life-threatening complications. Health education and motivation create positive changes in diabetes-control-related self-care practices (**Saleh et al, 2012 & IDF, 2013**).

DM requires skills with knowledge in using evidence-based advances in treatment and self-care skills. Self-care skills are practices used in every day to maintain healthy in patients with DM, which allow them to operate independently at home and help them to control blood glucose level, it helps clients to exposed to various skills that will be face the challenges in future to restore, prevent, treat, delayed and decrease complications (**Razzaq, 2013**).

There is clear evidence of the negative influence of type I or II diabetes non-insulin-dependent diabetes mellitus (NIDDM) on the prevalence, severity, and prognosis of cardiovascular disease. Epidemiologic studies have confirmed the relationship between NIDDM and the occurrence of coronary artery disease (CAD) and cardiac heart failure (CHF). The clinical aspects of NIDDM cardiac complications include a high

rate of silent events, which merit an improvement in their diagnosis and treatment (**Jacques Julien, 2014**).

Community health nurse role aims to work with general practices, the clients and their family to enhance health status of those with diabetes and improve lifestyle for people at risk or with diabetes through levels of prevention (**Kegley, et al, 2012**).

### **Significance of the study:**

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The prevalence of diabetes mellitus has increased significantly over the past two decades. Recent estimates project around 285 million people with diabetes around the world presently, and this number is set to increase to 438 million by the year 2030. According to the World Diabetes Atlas, The public awareness of the disease is low, more so in the rural areas where there are increasing number of patients (**Jain et al, 2014**).

The Middle East and the Northern Africa (MENA) have the highest prevalence of Diabetes as a world region, with six (MENA) countries making the top 10 ranking. Egypt has 7.5 million people with Diabetes. More than 34.2 million people in the MENA Region have diabetes; by 2030 this will rise to 59.7 million, Diabetes can lead to serious and costly complications, Diabetes caused 356,586 deaths, in the MENA Region this year (2013), (**IDF, 2013**).

The prevalence of type 2 diabetes mellitus (T2DM) has risen in recent decades, and cardiovascular disease remains the leading cause of death in this Population of all age groups affecting around 65–80%. Over time, diabetes can damage the heart, blood vessels, and increases the risk of heart disease and stroke. 50% of people with diabetes die of cardiovascular disease primarily heart disease and stroke (**Jennifer, 2012 & David et al., 2013 & Chillarón et al., 2014**).

### **Aim of the study**

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The aim of this study is to assess the knowledge and practices among diabetic clients regarding cardiovascular problems in a rural area, through:

- Recognizing the diabetic clients' knowledge regarding diabetes mellitus and cardiovascular problems.
- Assessing the diabetic clients' practices regarding diabetes mellitus and cardiovascular problems.

### **Research questions**

- 1) Is there relation between socio-demographic characteristics of diabetic clients and their knowledge?
- 2) Is there relation between socio-demographic characteristics of diabetic clients and their practices?
- 3) Is there relation between the diabetic clients' knowledge and their practices regarding cardiovascular problems?

### **Subjects and Methods**

#### **Technical design:**

#### **Research design:**

A descriptive study was utilized.

#### **Research setting:**

The study was conducted at diabetic' outpatient clinic at Kafr El-sheikh General Hospital, as almost of patients attending to it, from large parities, as well as it serve rural area, large sector of people with different socio-demographic characteristics.

### **Subjects of the study:**

Clients was attending to the clinic over a period of three months three days/week (Saturday, Tuesday and Thursday) and 100 Clients from the study population was met the selected criteria; the diabetic client should be diagnosed from 2-5 years ago, Have or have not cardiovascular problems after diagnosed with diabetes, Free from any other chronic diseases, which are not related to diabetes mellitus such as renal disease, liver disease ...etc., Both males and females, aged from 30-50 years.

### **Tools of data collection:**

Tools used for data collection were the following:

#### **First tool: An interviewing Questionnaire**

This tool is an Arabic interviewing questionnaire constructed by the researcher after reviewing related literatures .This tool was divided into three parts:

**Part one:** this part concerned with socio-demographic data as Gender, age, education level, marital status, type of occupation, family monthly income, family residence and Family Crowding Index.

**Part two:** this part concerned with patients' past and present health history as duration of illness, investigations, medications and previous complications.

**Part three:** this part includes was concerned with clients' knowledge regarding diabetes mellitus and its complications as regard: definition of DM, its causes, signs and symptoms, early signs and symptoms of cardiovascular problems, methods of prevention, schedule of follow up related to cardiovascular problems, proper investigations, and proper screening.

**Scoring system:**

In part three: Questions about the clients' knowledge were given scores (1) marks to the incorrect or unsatisfied answer and (2) marks to the correct or satisfied answer.

According to client answers, their knowledge was categorized into satisfactory level of knowledge  $\geq 50\%$  and unsatisfactory level of knowledge score  $<50\%$ .

**Second Tool:** Checklist to assess the diabetic clients' practices regarding diabetes mellitus and cardiovascular problems.

**Scoring system:**

The Questions were given scores (1) marks for steps that not done correctly, and scoring (2) marks for steps that done correctly.

According to client answers, the scoring system was divided into two levels done correctly  $\geq 60\%$  of total scores and not done correctly  $< 60\%$  of total scores.

**Operational design:**

**Preparatory phase**

A review of literature was done regarding current and past available literature and theoretical knowledge and the expertise opinions, covering the various aspects of the problem, using textbooks, articles, magazines and internet search. This was necessary for the researcher to get aquatinted with, and oriented about aspects of the study problems, as well as to assist in development of data collection tools.

**Administrative design:**

An official approval letter was obtained from the faculty of nursing, Ain Shams University, to the general manger of the outpatients' clinic as mentioned previously to

facilitate conducting the study, the researcher contacted with the subjects individually, and at that time, written consent was obtained from them after explanation of the purpose and nature of the study.

**Pilot Study**

Pilot study was conducted on 10% of total size of the sample and they were 10 diabetic clients, to test the study process and ensure the applicability of the developed tools for collection of data. All items of the tool were ensured for clarity, objectivity, feasibility of the study tools and to determine the time required filling the tools. Necessary modifications were carried out to suit the patients' level and develop the final form of the tool. Those patients were excluded from the study sample.

**Content validity:**

It was be ascertained by group of experts in community health nursing. Their opinions were elicited regarding the format layout, consistency, accuracy and relevancy of the tools.

**Ethical Consideration:**

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The subject rights were secured. The nature of the study was harmless and the client had the right to accept or refuse to participate at any time of the study. Verbal consent was obtained from each participating client. Ensure that privacy and confidentiality of all records and personal information was used only for study purpose.

**Fieldwork**

The actual process of data collection was carried out in the period from May to July 2015 three days /weekly nearly about 4 hours /daily (Saturdays, Tuesdays and Thursdays) from 9:00 AM to 1:00 PM. The researcher interviewed herself to the hospital' administrators and the other hospital

teamwork who was helped her in data collection to save the time and to gain the trust of clients. The researcher explained the aim of the study to all of them. The average time consumed to fill tools was 30 minutes.

### Statistical design:

The collected data was scored, tabulated and analyzed by personal computer using statistical package for the social sciences (SPSS) program version 22. The obtained findings were analyzed by appropriate statistical methods and test of significance was presented in tables and figures. Level of significance was set at  $p < 0.05$ .

### Results:

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**Table 1:** shows that 82 % of the total study sample was females. 82% of studied sample's age ranged from 45- 50 years. Regarding the level of education, 72% were illiterate and 6% were secondary level. According to marital status, 60% were married. About 62% of the study samples were Housewife and 18% had no work. Regarding the family monthly income, only 16% of the total sample had sufficient income. Regarding the family crowding index, 96% were living in not crowded homes.

**Table 2:** elaborates that 90 % of the total study sample their duration of diabetes were 4:5 years period. Regarding the hereditary factors, 54% of studied samples had family history of diabetes. In relation to detection of diabetes 86% of the total study sample were detected by complete blood test followed by 84% were detected from sings & symptoms and only 2% were detected from coma. The table also shows that 76% of the study sample' used insulin. Regarding investigations done it was found that 98% of the total study sample done urine analysis, random blood glucose test and fasting blood glucose test and only 6% done Micro albuminuria test.

**Figure 1:** reveals that diabetic's previous problems especially gum and teeth inflammations were most common among 92% of the total sample compared with 88% of the total sample suffered from psychological problems, about 36% complained of cardiovascular problems, and 12% had sexual problems.

**Figure 2:** shows that 24% of the total study sample had satisfied knowledge regarding diabetes mellitus, while 10 % of them had satisfied knowledge regarding diabetic cardiovascular problems.

**Table 3:** Clarifies that in relation to Foot care, 36% from the total studied sample their practices was correctly done about foot care and the table also shows that only 2% of the total studied sample their practices was correctly done for hypoglycemia and hyperglycemia control.

**Figure 3:** displays that 14% of the studied sample their practices stated by them regarding diabetes mellitus was correctly done, while 22% of them their practices to prevent diabetic cardiovascular problems was correctly done.

**Table 4:** mentions that there was no statistical significant association between clients' socio-demographic characteristics and their knowledge about diabetes mellitus, respectively at  $P > 0.05$ .

**Table 5:** illustrates that there was no statistical significant association between socio-demographic characteristics of diabetic clients and their practices, respectively at  $P > 0.05$ .

**Table 6:** demonstrates that there was statistical significant relation between diabetic clients' knowledge and their practices regarding diabetic cardiovascular problems prevention, respectively at  $P > 0.05$ .

**Discussion:**

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The present study revealed that age of the clients in the studied sample ranged between 30-50 years. The majority of the study sample their ages was ranged between the ages of 45 to 50 years (**table1**). this result was nearly in agreement with the study made in Egypt at Ain Shams University, by **Sobhy, (2013)** mentioned that the majority of the study sample their ages was between 40 to 45 years. Moreover, this result was nearly in agreement with **Mahfouz & Awadalla, (2011)** in El-Mina, Egypt and **Berhe et al, (2013)** in Ethiopia, their study showed that mostly respondents were in the age group of 30-60 years. This result was contradicted with **Kishore et al, (2015)** conducted in India, stated that the average age in a rural area was 51.18. These indicate that the diabetes is most commonly in old age group.

In relation to the diabetic clients' gender, more than three quarters of the total sample were females (**Table1**). This study agreed with **Assayed et al, (2014)** in Malawi, who stated that females were higher than males. Also in a similar study by **Kishore et al, (2015)** in Delhi, India who found that more than half of the sample was females. These findings disagreed with **Sobhy, (2013)** in Egypt, who mentioned that more than half of total sample were males. In addition, this result incongruence with a study carried out by **Oliva et al, (2012)** in Catalonia, who stated that nearly half of total sample were men. This difference may reflect physiological influence or varied opportunities for exposure and life style.

Regarding the educational level of the diabetic clients, the results of this study showed that the large portion of the total studied sample was illiterates (**Table1**). This study congruence with the study conducted in Egypt by **Sobhy,(2013)** stated that the majority of the study subjects' education was illiterate and below the faculty level. Also in similar to these results a study conducted by **Shrestha et al, (2013)** in India, who

emphasized that the majority of the study sample were illiterate. This result was contradicted with **Muninarayana et al, (2010)** in India, reported that about less than half of the respondents were illiterates.

The current study indicated that less than two thirds of the study sample was married. These findings were congruent with the study made in Egypt by **Sobhy,(2013)** pointed out that more than half of the study population were married. Moreover, this result was congruent with **Kishore et al, (2015)** in Delhi, India, who stated that the majority were married.

In concern to the family monthly income, the result of this study found more than three quarter of the diabetic' clients had insufficient monthly income (**Table 1**). These results were congruent with **Shrestha et al, (2013)** illustrated that three quarter of the sample had monthly income less than \$70 per month. This result was contradicted with the study made in Egypt by **Sobhy,(2013)** reported that more than half of the studied sample their economic status were sufficient. Also in contrast, a study of **El-Khawaga & Abdel-Wahab, (2015)** In Dakahlia, Egypt, who revealed that more than half of patients reported monthly income  $\geq$  1200 Egyptian pounds.

As regard occupational status, the present study asserted that more than half of the study was Housewife and no work (**Table1**). In similar to these findings a study made in Egypt, by **Sobhy,(2013)** showed that the majority of them were either housewives or laborer. In addition, these results were congruent with **Shrestha et al, (2013)** conducted in India, who showed that above half of the sample, were Housewives. Also In this context, the study by **Kishore et al, (2015)** conducted in India, who reported that above half of the study sample were unemployed.

In relation to duration of diabetes, the current study indicated that almost of the

studied samples three-thirds their duration of diabetes was 4:5 years period (**Table 2**). These findings were nearly congruent with **El-Khawaga & Abdel-Wahab, (2015)** conducted in Dakahlia, Egypt, who revealed that about two thirds of the patients have been diabetic since more than 5years. This indicates that the risk of diabetes increase by age. This study was contradicted with the study by **Sobhy,(2013)** conducted in Egypt, who found that more than two thirds of the studied sample had diabetes since 3 years ago.

Regarding the hereditary factors of the diabetic clients, the result of this study found more than half of studied samples had family history of diabetes (**Table 2**). These results were supported with the study by **Sobhy,(2013)** in Egypt, who pointed out that nearly half of the diabetics have positive family history of disease. In addition, this result was accepted with the research done by **Perveen, (2010)** in Pakistan, as family history of diabetes was found as a major risk factor of diabetes. This asserts that family history becomes a major risk factor for increasing diabetes prevalence.

In the light of the present study results as regards types of treatment, showed that more than three quarters of the study sample' treated by insulin (**Table 2**). This result was contradicted by **Sobhy,(2013)** in Egypt, who reported that more than half of the studied sample treated by oral hypoglycemic medications. In addition, this result was disagreement with **Mahfouz & Awadalla, (2011)** in El-Mina, Egypt, who stated that nearly one third of the patients used insulin and more than half-used oral hypoglycemic. The researcher found these higher percentages of the clients insulin used indicate that their poor knowledge and practices for diabetes control.

Focusing on diabetic's previous problems, this result was found that the majority of the total sample was suffered from gum and teeth inflammations followed

by psychological problems and vision problems, less than two quarters suffered from urinary complications, more than half had difficult wounds healing, about more than one third complained of cardiovascular problems, and the minority of them had sexual problems (**Figure2**). This result was nearly in agreement with the study of **Muninarayana et al, (2010)** conducted in India, who reported that most common complications reported by the participants were eye problems followed by kidney disease, foot problems and heart attacks. Also These results were in line the same with **Kishore et al,( 2015)** conducted in India, who revealed that the majority complained of weakness of vision and urinary complications but more than one quarter of them complained of cardiovascular problem and the minority of them had sexual problems.

In concern to clients' total knowledge about diabetes, the present study emphasized that more than three quarters of studied sample, their knowledge were unsatisfied about diabetes. While less than one quarter of them, their knowledge were satisfied about diabetes. Regarding the meaning of diabetes, the causes of diabetes, risk factors, the normal ranges of blood sugar, complications of diabetes and causes and symptoms of hypoglycemic and hyperglycemic coma. (**Figure2**). These results were supported many other studies results in Egypt, Arabian region and international. As this result was congruence with **Shrestha et al (2013)** conducted in Nepal, who concluded that in his study the majority of the respondent had no knowledge about diabetes. And this result was in agreement with a study by **EL-jake, (2012)** carried in United Arab Emirates, who reported that the majority of patients are not-knowing diabetes mellitus and its complication This result was contradicted with the study by **Sobhy, (2013)** conducted in Egypt, who pointed out that the majority of the study populations had average knowledge regarding diabetes while only 4 % had poor knowledge about diabetes. As well

as The study of **El-Khawaga & Abdel-Wahab,(2015)** in Dakahlia, Egypt, revealed that the overall rate of adequate knowledge regarding diabetes was approximately half among participants. Insulin-treated patients had lowest knowledge, attitude, and practice toward diabetes. Moreover, this indicates that knowledge about diabetes is poor in rural population.

The present study mentioned that approximately half of total studied sample, their knowledge was satisfied regarding the Symptoms of hyperglycemic coma (**Table3**). this result was contradicted with the study by **Sobhy, (2013)**conducted in Egypt, who pointed out that more than three quarter of the studied sample had good knowledge about hyperglycemia symptoms.

The current study indicates that only few 4 % had satisfactory level of knowledge about diabetes mellitus and its complications. Similarly, our study in rural area a study conducted by **Muninarayana et al,(2010)** in India, showed that the major findings was the knowledge regarding diabetes is very poor in rural areas. Only 4% of the participants reported that they knew about a condition called diabetes. In addition, the study by **Assayed et al, (2014)** conducted in Malawi, reported that more than half of patients had little or no information about diabetes. Moreover, the results of a study conducted by **Kishore J. et al, (2015)** conducted in Delhi, India, reported that the majority of the total sample had no knowledge about diabetes. Also this result was congruence with a study by **Berhe et al,(2014)** carried in Ethiopia , stated that more than half number of the respondents score poor knowledge on diabetes and those were more problematic. This indicates that majority of the patients have not been taught about diabetes by their physicians.

As regard to Foot care, this study clarified that more than one third of the study sample their practices were correctly done about Feet care (**Table 3**). This result was

nearly congruence with the study carried by **Assayed et al, (2014)** conducted in Malawi, who reported that approximately one quarter having their feet inspected regularly. In addition, the results agreed with a study conducted by **Kishore et al, (2015)** in India, found that similarly awareness about foot care was been low. In the opposite to those findings the results by **El-Khawaga & Abdel-Wahab,(2015)** In Dakahlia, Egypt, revealed that more than three quarters of the participants had correct knowledge about importance of foot protection and care, Periodic feet examination. In addition, this result was incongruence with the study carried by **Muninarayana et al, (2010)** in India, who observed that the major findings in their study used footwear regularly. Periodic Feet Examination is recommended every 3 months, periodic retinal, renal and heart examination is recommended every year according to Egyptian national guidelines.

This study also clarified that the minority of total studies sample, their practices for management of hyperglycemia and hypoglycemia were correctly done (**Table 3**). That deficit could be due to deficient awareness of the clients and inadequate health instructions. Similarly, to our findings in study conducted by **El-Khawaga & Abdel-Wahab,(2015)** In Dakahlia, Egypt, showed that nearly half of them were aware about symptoms of hypoglycemia, about one quarter of them were knowledgeable about causes of hypoglycemia but disagreed about management of hypoglycemia, as more than one third of studied patients were knowledgeable about management of diabetes by lifestyle changes. This result was congruence with **Kishore J. et al, (2015)** conducted in Delhi, India, As well as in a study carried out by **Upadhyay et al, (2012)** in Nepal, illustrated that low knowledge about how to manage hypoglycemic symptoms.

In concern to total practices for diabetic control the majority of studied sample, their practices were incorrectly done (**Figure 4**). These results were in agreement with the study carried by **Shams and Barakat, (2010)** in Egypt, reported that self-management behavior as regular monitoring of blood glucose found to be low more than one quarter among study population. This study was in agreement with a study conducted by **Muninarayana et al, (2010)** in India, reveals that about nearly half of the diabetic respondents were not aware of self-care in diabetes. This emphasizes the need for carrying the right messages regarding diabetes right down to the masses and extending diabetes education activities to rural areas. In contrast to these results the study carried by **Hasnain et al, (2009)** in Lahore, reported that nearly a half had satisfactory practices and more than one third had poor practices.

In relation to total practices to prevent diabetic cardiovascular problems, more than three quarters of studied sample, their practices to prevent diabetic cardiovascular problems incorrectly done (**Figure 3**). In agreement with those findings **El-Khawaga & Abdel-Wahab, (2015)** In Dakahlia, Egypt, revealed that only one third of diabetic patients were aware about diet plan during health, illness and cardio protective effect of limiting cholesterol also the importance of regular exercise. These results highlight the need for educational programs aimed at improving the knowledge of the effects of DM on the cardiovascular system including the need for regular cardiovascular examinations.

The current study asserted that there was no statistical significant association between clients' socio-demographic characteristics and their knowledge about diabetes mellitus, respectively at  $P > 0.05$  (**Table 4**). This result was congruence with **Hasnain et al, (2009)** conducted in Lahore, reported that sex and income had shown no significant statistical association with

knowledge and practices regarding diabetes. This result was incongruence with **El-Khawaga & Abdel-Wahab, (2015)** In Dakahlia, Egypt, showed that a higher level of knowledge with highly statistically significant differences was among patients and males were significantly knowledgeable. Also This result was contradicted with a study by **Zhong et al, (2011)** China and study by **Berhe et al, (2014)** carried in Ethiopia, pointed out that there was association between respondents' age, monthly income, level of education, occupation and diabetes family history with diabetes knowledge level. Those findings indicate that there was a lack of awareness about the possibility of diabetes prevention.

The present study illustrated that there was no statistical significant association between socio-demographic characteristics of diabetic clients and their practices, respectively at  $P > 0.05$  (**Table 5**). This result was congruence with a study by **Hasnain et al, (2009)** in Lahore, who stated that sex and income per capita had shown no significant statistical association with knowledge and practices regarding foot care. Those findings contradicted with **El-Khawaga & Abdel-Wahab, (2015)** in Dakahlia, Egypt, indicated that good practice was statistically significant among literate, working patients, with high income  $> 1200$  LE. Also in the opposite to a study by **EL-jake, (2012)** carried in United Arab Emirates, reported that there was a significant relationship between the level of education and the knowledge, attitude and practice regarding diabetes, while age and occupation were significantly associated with knowledge only. These discrepancies might be due to differences in the country culture.

The current study demonstrated that there was statistical significant relation between diabetic clients' knowledge and their practices regarding diabetic cardiovascular problems prevention, respectively at  $P > 0.05$  (**Table 6**). This result was congruence with a study by **Zhong et al, (2011)** in China, who stated that best performance in self-

management achieved when those with type 2 diabetes have a high degree of knowledge of diabetes, positive attitudes toward diabetes, strong self-efficacy for self-management. Also this result was agreed with a study by **Berhe et al,(2014)** carried in Ethiopia , who reported that diabetes outcome depends mainly on the patient' sound knowledge of self-care and the disease that is dependent upon their knowledge of the disease, including health-related behavior and care-seeking. As the level of patients' knowledge about the disease, its causes, drug therapy and complications directly affect their practices.

### **Conclusion:**

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In the light of the present study findings, it could be concluded that:

The majority of the total study sample was females. Furthermore, most of them their age ranged from 45- 50 years. The large portion was illiterate. Regarding total knowledge about diabetes less than one quarter of them their knowledge were satisfied about diabetes. While almost of them, their knowledge was unsatisfied about diabetic cardiovascular problems. The findings also demonstrated that the majority of studied sample, their practices stated by them regarding diabetic control were incorrectly done. While total knowledge about practices to prevent diabetic cardiovascular problems, more than three quarters of studied sample, their knowledge about practices to prevent diabetic cardiovascular problems were incorrectly done compared with less than one quarter were done correctly. Moreover, the current study asserted that there was no statistical significant association between clients' socio-demographic characteristics and their knowledge about diabetes mellitus, and their practices. In addition, there was statistical significant association between diabetic clients knowledge and their practices regarding cardiovascular problems, respectively at  $P > 0.05$ .

### **Recommendations:**

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**The findings of this study recommend the needs for:**

- Periodic physical examination and screening for early identification and detection of diabetic health problems and prompt intervention.
- Extensive health education and health promotion programs are recommended to prevent diabetic cardiovascular complications and life style modifications.
- Baseline data for formulating prevention programs for diabetes.
- Accessibility of a specific booklet in out patients diabetic clinics that increase the diabetic clients' knowledge and practices about diabetes and its complications, treatment compliance and regular follow up.

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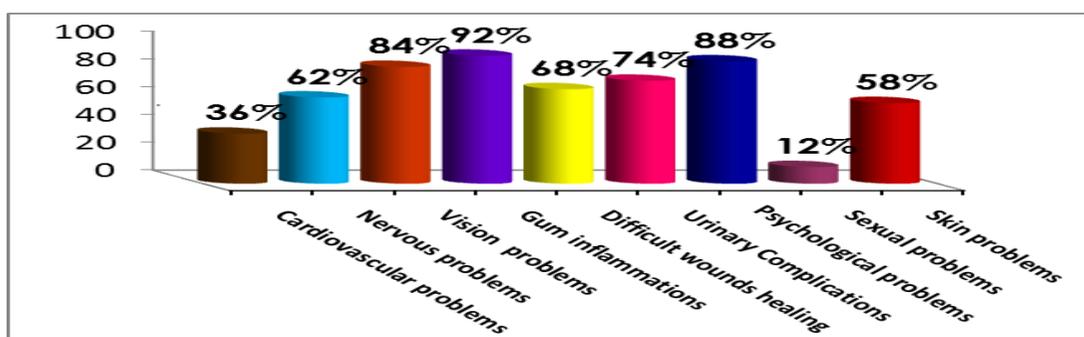
**Table (1): Distribution of diabetic' clients according to their Socio-demographic Characteristics (N =100).**

<b>Item</b>	<b>No</b>	<b>%</b>
<b>Gender:</b>		
Male	18	18
Female	82	82
<b>Age in years:</b>		
30 –	4	4
35–	2	2
40–	12	12
45–50	82	82
<b>Educational level :</b>		
Illiterate	72	72
Basic Education	22	22
Secondary level	6	6
<b>Marital status:</b>		
Single	14	14
Married	60	60
Widow	26	26
<b>Occupation:</b>		
Jobless	18	18
Private work	20	20
House wife	62	62
<b>Monthly income:</b>		
Sufficient	16	16
Insufficient	84	84
<b>Family Crowding Index:</b>		
Not crowded < 3	96	96
overcrowded > 3	4	4

**Table (2) Distribution of diabetic clients according to their medical history (N =100).**

Item	No	%
<b>Duration of diabetes:</b>		
2:3 years	10	10
4 :5 years	90	90
<b>Family history with diabetes:</b>		
yes	54	54
No	46	46
<b>*Detection of the diabetes:</b>		
Sings & Symptoms	84	84
Urine analysis	72	72
Complete blood test	86	86
Coma	2	2
By chance	14	14
<b>Medication used:</b>		
Oral medication	24	24
Insulin	76	76
<b>*Investigation done:</b>		
Urine analysis	98	98
Complete Blood Analysis	96	96
Random blood glucose test	98	98
Fasting Blood glucose test	98	98
Hemoglobin A1C (HbA1C	22	22
Cholesterol and triglycerides test	40	40
Kidney function test	28	28
Micro albuminuria test	6	6
ECG	60	60
Eye examination	42	42

N.B: "Responses weren't mutually exclusive"



N.B: "Responses weren't mutually exclusive"

**Figure (1): Distribution of the study sample according to their Diabetic's previous problems (N =100)**

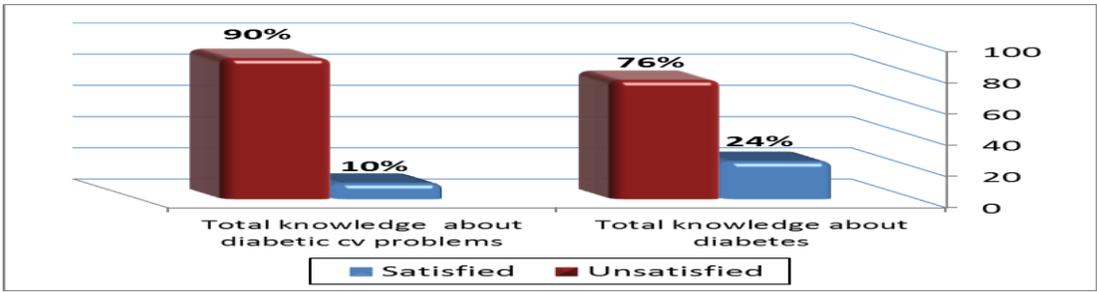


Figure (2): Distribution of the study sample according to their Total knowledge regarding Diabetes mellitus and Diabetic cardiovascular problems (N =100)

Table (3): Distribution of clients according to their practices stated by them about diabetic control (N=100).

Items	Correctly done		Not done	
	No	%	No	%
Foot care	36	36	64	64
Practices for hyperglycemia control	2	2	98	98
Practices for hypoglycemia control	2	2	98	98

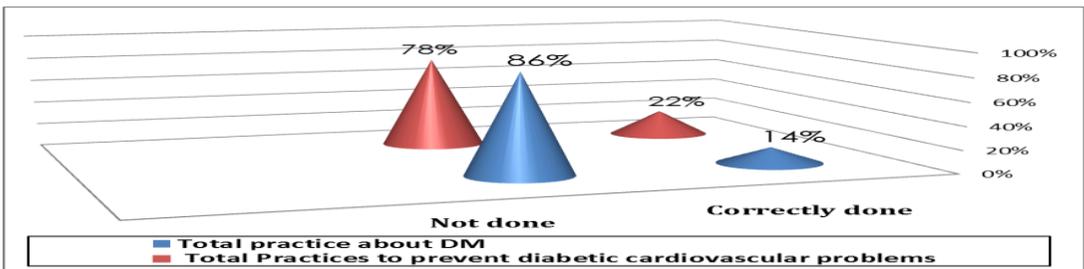


Figure (3): Distribution of the study sample according to total practices stated by them regarding diabetes mellitus and total practices to prevent diabetic cardiovascular problems.(N =100).

**Table (4): Relation between diabetic client's knowledge and their socio-demographic characteristics. (N=100).**

Items	Total knowledge about diabetes mellitus				Chi-Square Test	
	Satisfied (N = 24)		Unsatisfied (N =76)		X2	P
	N	%	N	%		
<b>Gender:</b>						
Male	2	8.3	16	21.1	1.999 Df=1	P >0.05
Female	22	91.7	60	78.9		
<b>Age in years:</b>						
30 –	0	0.0	4	5.3	2.608 Df=3	P >0.05
35–	0	0.0	2	2.6		
40–	2	8.3	10	13.2		
45–50	2	91.7	60	78.9		
<b>Educational level:</b>						
Illiterate	20	83.3	52	68.4	2.866 df=2	P >0.05
Basic education	4	16.7	18	23.7		
Secondary	0	0.0	6	7.9		
<b>Occupation:</b>						
Jobless	4	16.7	14	18.4	3.041 df=2	P >0.05
private	2	8.3	18	23.7		
House wife	18	75.0	44	57.9		

**Table (5): Relation between diabetic client's practices and their socio-demographic characteristics**

Items	Total practices				Chi-Square Test	
	Correctly done (N = 14)		Not done (N =86)		X2	P
	N	%	N	%		
<b>Gender:</b>						
Male	2	14.3	16	18.6	.152 Df=1	P >0.05
Female	12	85.7	70	81.4		
<b>Age in years:</b>						
30 –	0	0.0	4	4.7	1.075 Df=3	P >0.05
35–	0	0.0	2	2.3		
40–	2	14.3	10	11.6		
45–50	12	85.7	70	81.4		
<b>Educational level:</b>						
Illiterate	20	85.7	60	69.8	1.842 Df=2	P >0.05
Basic education	2	14.3	20	23.3		
Secondary	0	0.0	6	7.0		
<b>Occupation:</b>						
Jobless	4	28.6	14	16.3	1.338 Df=2	P >0.05
private	2	14.3	18	20.9		
House wife	8	57.1	54	62.8		

**Table (6): Relation between diabetic client's knowledge and their practices regarding cardiovascular problems (N=100).**

Items	TOTAL Knowledge regard diabetic cardiovascular problems prevention				Chi-Square Test	
	Satisfied (N = 10)		Unsatisfied (N =90)		X2	P
	N	%	N	%		
<b>Practices to prevent diabetic cardiovascular:</b>						
Correctly done	6	60.0	16	17.8	9.350 df=1	P < 0.05
Not done	4	40.0	74	82.2		