Relation between Knowledge and Self Care Practices Among Diabetic Patients.

Samia Mohamed Hashad
Medical Surgical Nursing, Faculty of Nursing, Alexandria University

Anesa Ahmed El kholy, Assistant professor
Medical Surgical Nursing, Faculty of Nursing, Alexandria University

Gehan Mohamed Desoky, Assistant professor
Medical Surgical Nursing, Faculty of Nursing, Alexandria University

Abstract

Background: *Diabetes mellitus is a group of metabolic disorders characterized by elevated blood sugar levels as a result of deficiencies in insulin secretion, insulin action, or both, which lead to abnormalities in glucose, lipid, and protein metabolism. Diabetic patients also have an increased risk of other diseases, including heart, peripheral, arterial and cerebrovascular diseases.* ***Aim:*** *This study aimed to identify the relation between knowledge and self-care practices among diabetic patients.* ***Design:*** *A correlational descriptive research design was used to accomplish the aim of the present study.* ***Setting:*** *The study was conducted at kafr Elziat general hospital affiliated to ministry of health, in the outpatient clinic of diabetes. The outpatient clinic works six days a week from Saturday to Thursday from 9Am-2Pm.* ***Subjects:*** *A convenience sample of 150 adult patients were included in the study.* ***Tool****: One tool was used for conducting this study (Diabetic patient's knowledge and self-care practices structured interview schedule).* ***Results:*** *There were positive statistically significant differences between the patient's level of knowledge mean scores and the patient's age, level of education, and marital status where p = (0.008, 0.001, 0.031 respectively). There were positive statistically significant differences between patients' self-care practices mean scores and patients' age, sex, level of education, occupation, and marital status where p=(0.004, 0.001, 0.001, 0.004, 0.046 respectively).* ***Conclusion:*** *It can be concluded that, more than half of the studied patients had a fair level of knowledge, in addition, more than half of the studied patients had a fair level of self-care practices.* ***Recommendations:*** *Development of health education programs for patients and their families to improve their knowledge about therapeutic regimen. Specialized survey should be done to explore barriers associated with diabetes management, including patients healthcare providers and health systems related barriers.*

Keywords: Diabetes mellitus, Diabetes knowledge, Self-care practices.

Introduction

Diabetes mellitus is a group of metabolic disorders characterized by elevated blood sugar levels as a result of deficiencies in insulin secretion, insulin action, or both. Numerous pathogenic processes are involved in the progression of diabetes. These range from defects that result in resistance to insulin action to autoimmune destruction of the pancreatic beta-cells with subsequent insulin insufficiency. Poor action of insulin is the underlying cause of anomalies in glucose, lipid, and protein metabolism in diabetes (Punthakee et al., 2018).

Type 1 diabetes and type 2 diabetes are the two main types of diabetes. The cause of type 1 diabetes is a complete lack of insulin secretion, whereas the cause of type 2 diabetes is a combination of resistance to insulin action and an inadequate compensatory insulin secretory response. In type 2 diabetes, the level of hyperglycemia is sufficient to cause pathologic and practical changes in a variety of target tissues, but

without any clinical signs and symptoms, which can exist for a long time before diabetes is discovered. Despite the fact that both type 1 and type 2 diabetes are caused by a relative or absolute lack of insulin, the two conditions have completely distinct illness profiles and are thus managed differently (Sapra & Bhandari, 2022; World Health Organization [WHO], 2021).

Diabetes is a rapidly growing health concern in Egypt that has a significant impact on morbidity, mortality, and the availability of health care resources. In 2021, the International Diabetes Federation predicts that there will be 537 million people worldwide with diabetes, including more than 73 million people in the Middle East and North Africa region. By 2045, this number might rise to 783 million. Additionally, according to the International Diabetes Federation (IDF), Egypt has 10.9 million people with diabetes (aged 20 to 79 years old), and that number is expected to double by 2045, reaching almost 20 million DM patients (International Diabetes Federation [IDF], 2021).

Diabetes risk factors can be divided into non-modifiable risk factors such as aging, sex, genetics, family history of diabetes type 2, ethnicity, and history of gestational diabetes, and modifiable behavioral risk factors, such as poor food, sedentary lifestyle choices, and hazardous alcohol and cigarette use. Additionally, type 2 diabetes occurs more frequently in patients with hypertension and in women who had earlier gestational diabetes (Ellulu & Samouda, 2022).

In a patient with type 1 diabetes, it may appear suddenly with specific signs and symptoms because the pancreatic beta cells that produce insulin are being quickly destroyed. Hyperglycemia typically develops gradually over a long period in a patient with type 2 diabetes, leading to much less obvious symptoms that many people learn to live with. Some people with type 2 diabetes may not be exhibiting any symptoms, at the time of the diagnosis. As a result, when type 2 diabetes is detected, it may have already caused irreparable damage to numerous organs and tissues. This is because diagnosis is usually delayed, sometimes by several years (Knight et al., 2017). Polydipsia, Polyuria, and Polyphagia are common symptoms of diabetes mellitus. Additionally, hyperglycemia can cause tiredness, impaired vision, headaches, stomach pain, yeast infections, and poor wound healing (Khardori, 2022).

Chronic hyperglycemia is accompanied by high mortality and morbidity due to its concurrent microvascular complications, such as nephropathy, neuropathy, and retinopathy, as well as macrovascular complications, such as hypertension, hyperlipidemia, coronary heart attacks, coronary artery disease, strokes, cerebral vascular disease, peripheral vascular disease. Untimely atherosclerosis, myocardial infarction, stroke, and cardiac dysfunction are the main problems associated with cardiovascular disease in diabetics (Ohiagu et al., 2021).

The management of type 1 and type 2 diabetes concentrates on improving glucose control through pharmaceutical therapy and way-of-life modification. Patients must actively participate in their care for effective diabetes management, which necessitates engaging in numerous complex self-care behaviors like dietary adjustments, regular exercise, and psychosocial coping mechanisms as well as clinical self-care activities like medication use and blood glucose monitoring (Davies et al., 2022). In addition, the improvement of the latest technology to enhance the control of DM, along with such continuous glucose monitoring systems (CGMS) that degree glucose in interstitial fluid, display that they may be the fine manner to reveal glucose ranges to keep away from hypoglycemia and to lessen glucose excursions (Arroba & Aguilar-Diosdado, 2022).

One of the main factors contributing to good self-care practices and glycemic control is a good knowledge. Knowledge has a crucial role in the improvement of any

future illness as well as in its early diagnosis and prevention. For DM patients, knowledge and practices are essential. Therefore, poor self-care knowledge can lead to poor long-term metabolic control, which may also lead to an improvement in diabetes complications (Fatema et al., 2017). Numerous studies show that diabetes knowledge is lacking in developing and underdeveloped nations and that this knowledge has to be improved by continuous education provided by health care professionals including pharmacists, nurses, and doctors. To fulfill the assignment of rising healthcare expenditures, knowledge of diseases is essential (Fottrell et al., 2018; Lotfy et al., 2022).

Nurses play a crucial role in helping patients manage diabetes-related morbidity and mortality to improve their medical outcomes. Nurses can also screen patients for diabetes early on, recognize and prompt corrective action for inadequate treatment regimens, help patients set and achieve recovery goals, and look into diabetes-related complications as they develop. In doing so, they may anticipate playing a significant role in boosting patients' knowledge by educating patients on the novel character of the illness and the value of early therapy (Alshammari et al., 2021). Therefore, this study was conducted to find out how knowledge and self-care habits among diabetes patients relate to one another.

The aim of this study is to:

Identify the relation between knowledge and self-care practices among diabetic patients.

Research question:

What is the relation between knowledge and self-care practices among diabetic patients?

Materials and Method

Materials:

Research DesignA correlational descriptive research design was utilized for this study.

Setting:

The study was conducted at kafr Elziat general hospital affiliated to ministry of health, in the outpatient clinic of diabetes. The outpatient clinic works six days a week from Saturday to Thursday from 9Am-2Pm, and received about 15-20 patients per day.

Subjects:

A convenience sample of 150 patients who were admitted to the above mentioned setting were comprised the study subjects. It was selected based on the Epi info-7 program, used to estimate the sample size using the following parameters:

1. Population size is 614 through two months
2. Minimum sample size 131
3. Expected frequency 50%
4. Acceptable errors 10%
5. Confidence coefficient 90%

The subjects' were considered eligible to participate in the study if they met the following criteria:

Adult patient confirmed with diagnosis of type 2 diabetes more than 5 years.

Tool:

One tool was used for conducting this study:

Diabetic patient's knowledge and self-care practices structured interview schedule:

This tool was developed by the researcher after reviewing the related literatures (Dussa et al., 2015; Eigenmann et al., 2011; Heggy, 2001; Shaban, 2018). It was used to assess knowledge and self-care practices among diabetic patients. It was include the following parts.

Part I: Socio-demographic and clinical data:

A) Socio-demographic data: It included patient's personal data such as patient's name, gender, age, level of education, occupation, religion, area of residence and social status.

B) Clinical data: It included past and present patient's health history, family history, drug history, smoking history, duration of disease, weight and height.

Part II: Diabetic patient's knowledge:

This part was used to assess patient's knowledge about diabetes mellitus. It included 26 questions about signs and symptoms of diabetes and its complications, diabetes dietary guidelines, benefits of physical activity, periodic checkup, importance of foot care, symptoms of diabetic complications, action performed during acute complications and precautions of insulin injection.

Scoring of diabetic patients' knowledge:

Answers related to diabetic patients' knowledge were scored on 2 points likert scale as the following:

- Correct answer = 1
- In correct answer or don't know = 0

The total patients' knowledge score was calculated and transferred to percentage as the following:

>75% of the correct answers = Good knowledge

50-75% of the correct answers = Fair knowledge

<50% of the correct answer = Poor knowledge

Part III: Self-care practices of diabetic patients: It included data related to self-care practices: It consisted of eight sub items namely: medications, dietary pattern, physical exercises, blood glucose monitoring, skin and foot care, oral care, diabetic complications, and follow up care.

Scoring of diabetic patients' self-care practices

The diabetic self-care practices was calculated for each area of diabetes regimen as follows:

- Correct answer provided 1
- Incorrect answer, didn't know or do nothing 0

Total score Diabetic patients' self-care practices was calculated and transferred to percentage as following:

>75% of the correct answers = Good self-care practices

50-75% of the correct answers = Fair self-care practices

<50% of the correct answer = Poor self-care practices

Method:

The study was accomplished as follows:

Written approvals:

Official approval to carry out the study was obtained from the Research Ethics committee at the Faculty of Nursing, Alexandria University. Also, an official letter was directed from Faculty of Nursing, Alexandria University, to the director of selected hospital setting in order to obtain approval to collect the necessary data, after explanation the aim of the study.

The study tool:

The tool was developed by the researcher based on the review of the relevant literature and was translated into Arabic language. Then pilot study was done to test it's feasibility and applicability.

Content validity:

The constructed tool was revised by a jury of 5 experts in the field of Medical Surgical Nursing, and one expert in field of Nursing Education, Faculty of Nursing, Alexandria University, to test content validity, completeness, and clarity of items. Comments and suggestions of jury were considered and the tool was modified accordingly.

Reliability:

The reliability of the developed tool was statistically tested by the Cronbach's coefficient alpha test. The tool proved to be internally reliable.

Data collection:

- The data were collected by the researcher for each patient once using individualized interview.
- The interview ranged from 30 to 40 minutes on individual session.
- Data were collected in the morning shift at the reception of diabetic outpatients clinic before examination.
- Data were collected throughout a period of three months from the beginning of October 2021 up to end of December 2021.

Ethical considerations:

Written informed consent was obtained from each study subject after explanation of the aim of the study.

- The anonymity and confidentiality of patients' responses were assured.
- The participants were informed that their participation was not obligatory, and they had the right to refuse the participation in the study.
- The patients were informed that they have the right to withdraw from the study at any time.

Statistical analysis of the data:

- After data were collected, they were coded and transmitted into specially designed formats, to be suitable for computer feeding.
- Verification processes were carried to avoid any errors during data entry.
- Data were fed to the computer and analyzed by using IBM SPSS software package version 20.0.
- Qualitative data were described by using numbers and percentages.
- Quantitative data were described by using averages[Minimum, Maximum, Arithmetic mean(X),Standard deviation (SD)].
- Statistical analysis tests included: Chi-square, Fisher's Exact test, Monte Carlo test, ANOVA test and Pearson coefficient(r).
- Tables of different characteristics were presented.
- Graphical presentation included: Bar graphs were done for data visualization.
- Significance of the obtained results was judged at the 0.05 level.

Results

Table (1): Shows the percentage distribution of patients according to their socio-demographic data. The sample comprised 60.7% of female patients. The highest percentage 64.7% were in the age group 50-60 years, while 2% were in the age group 20-30 years. Regarding the **level of education**, the highest percentage 44% were illiterate, and only 2.7% completed a university education. Concerning **occupation,** more than half of the patients 52.7% were housewives. In addition, the majority of patients 96.7% were Muslims. Also, more than three-quarters of the studied patients 82.7% were married. Regarding the residence area, the results showed that nearly three-quarters of patients 75.3%, were from rural areas.

Table (2): Shows the percentage distribution of patients according to their clinical data. The sample comprised 46% of patients who suffer from diabetes for more than 5 years – less than 10 years, and 21.3% of patients had diabetes from 10<15 years. As regards medications nearly half of the patients, 49.3% were on insulin therapy only, 41.3% of patients were on hypoglycemic tablets only, and 9.3% of patients were treated with both hypoglycemic tablets and insulin. Also, more than half of the patients 60.7% suffer from hypertension with diabetes. Moreover, more than half of patients 54.7% did the visit for follow-up. Regarding the family history of diabetes, nearly two-thirds of patients 67.3% had a diabetic family member. Additionally, more than three-quarters of 79.3% didn't smoke.

Table (3): Percentage distribution of studied patients according to their level of knowledge.

Concerning the total score of diabetic patients' level of knowledge, the results showed that nearly half of patients 53.3% had a fair level of knowledge, 7.3% had a poor level of knowledge, and more than one-third of patients 39.3% had a good level of knowledge.

Table (4): Percentage distribution of studied patients according to their self-care practices.

Regarding the total score of diabetic patients' self-care practices, nearly half of the studied patients 52.7% had fair self-care practices, less than half of patients 44% had poor self-care practices, and only 3.3% had good self-care practices.

Table (5): Reveals the relationship between the studied patients' level of knowledge and their demographic data:

There were positive statistically significant differences between the patient's level of knowledge mean scores and the patient's age, level of education, and marital status where p = (0.008, < 0.001, 0.031 respectively). However, there were no statistically significant differences found between the patient's level of knowledge mean scores and the patient's sex, occupation, religion, and area of residence where p = (0.326, 0.406, 0.329, 0.400 respectively).

Table (6): reveals the relationship between the studied patients' self-care practices' mean scores and their demographic data.

There were positive statistically significant differences between patients' self-care practices mean scores and patients' age, sex, level of education, occupation, and marital status where p=(0.004, 0.001, < 0.001, 0.004, 0.046 respectively). While there were no statistically significant differences found between patients' practice mean scores and their religion and area of residence where p= (0.155, 1.000 respectively).

Table (7): shows the relationship between the studied patients' self-care practices' mean scores and their level of knowledge.

There were positive statistically significant differences found between patients' practice mean scores and their level of knowledge where p < 0.001. It was observed that the highest percentage of the studied patients who had fair self-care practices, had good level of knowledge.

Discussion

The findings of the present study showed that, as regards to **socio-demographic data of the studied patients**, it was noted that; concerning **sex** and **age** more than half of the studied patients were females and in the age group 50-60 years. This may be due to the higher prevalence of obesity and sedentary lifestyle among females, in addition, age is a risk factor for the development of diabetes, so the most prevalence of diabetes among this age group. These results stand in the same line with the findings of Abdu El- Aal et al. (2019), and ALotaibi (2020), reported that more than half of the studied patients were females and in the age group from 51 to 60 years.

As regards **the level of education**, the results of the current study revealed that more than one-third of patients were illiterate, this finding may be because illiterate people are believed to have behaviors that increase the risk of type 2 diabetes such as smoking, and poor dietary habits. This result comes following Abd-El Rohman et al. (2017), reported that more than one-third of patients were illiterates.

Concerning **occupation**, more than half of the patients were housewives. This finding may be due to that, most of the studied patients were females who have a lot of housework activities and responsibilities and ignored the adoption of healthy lifestyles, in addition, they have

a higher risk for obesity which led to an increased risk for DM. This finding was matched with Marzouk et al. (2017), found that more than half of the patients were housewives.

Furthermore, it has been noted that the majority of the studied patients were coming from rural areas. This may be because urban ways of living and sedentary lifestyles are gradually being adopted by the rural masses as well, additionally, low education was more prevalent among rural areas, which may be associated with less access to healthcare services and information on DM, opportunities to lead a healthy life and individual lifestyle choices. This finding was in the same line with Azzam et al. (2021), revealed that most patients were from rural residency. While findings of the present study conflicted with the findings of Kavya and Bant (2019), found that the majority of the population was from urban areas. This difference in results might be related to the setting where data were obtained.

Regarding **clinical data of the studied patients**, it was noted that; concerning the medications, the results of the present study revealed that nearly half of the patients were on insulin therapy. This result may be interpreted by; the highest percentage of patients suffer from diabetes for more than 5 years and due to the progressive nature of the disease, which requires timely optimization of the treatment, leading to a majority of cases shifted to insulin therapy to maintain glycemic control. This result was in the same line with Abera et al. (2022), reported that nearly half of patients were on insulin therapy. While the result of the current study contradicted with Marzouk et al. (2017), found that the majority of the studied patients were on hypoglycemic tablets. This difference in the results might be related to the differences in duration of the disease among the studied patients.

Regarding the **reason for the medical visit**, the present study found that more than half of the patients came for follow-up. This result may be due to the patients' need to obtain monthly therapy for insulin therapy and also a periodic physical follow-up from free-of-cost hospitals. This result is nearly similar to the findings of Abdu El- Aal et al. (2019), found that the majority of the studied patients came to the diabetic clinic for follow-up. As regards **family history**, the current study revealed that nearly two-thirds of patients had a diabetic family member. This result may be due to endogamy which is common in rural areas in Egypt. This result is following Molalign Takele et al. (2021), revealed that the majority of the studied patients had a diabetic family member. Concerning **smoking history**, it was noted that more than three-quarters of patients didn't smoke. This result may be due to that the majority of patients being females and smoking prevalence is much less among females than males. This result stands in the same line with the findings of Molalign Takele et al. (2021), found that the majority of the studied patients were non-smokers.

As regards the **level of knowledge**, in the current study, the patients' knowledge scores proved that more than half of the studied patients had fair level of knowledge and more than one-third of patients had a good level of knowledge. The interpretation of this result might be related to that, the hospital provides diabetes health education in the hospital's outpatient department, so the majority of the studied patients received adequate information about diabetes from healthcare providers through educational models when they visit for medical follow-up. These findings were matched with the studies done by Zowgar et al. (2018), and Alsous et al. (2019), find that the majority of patients had an average level of diabetes knowledge. While the finding of the present study was conflicted with Babikr et al. (2017), revealed that the highest percentage of participants had a low level

of knowledge. The difference in the results of studies may be due to, these studies being carried out among different ethnic or age groups.

Concerning the **total score of diabetic patients' self-care practices**, more than half of the patients had fair self-care practices and less than half of the patients had poor self-care practices. These results may be related to many factors such as social support, life disruptions, denial of illness, social attitudes, responsibilities, and financial costs, that can influence the self-care practice. These results were completely matched with Chinnappan et al. (2020), found that more than half of the patients had an average score of self-care and less than half of the patients had a poor level of self-care practices. On the other hand, these findings contradicted Ketema et al. (2020), found that nearly half of patients had good diabetes self-care behaviors. The reasons for this difference in results could be due to differences in culture and economic status, lifestyle differences, and differences in access to healthcare facilities.

Regarding the **relationship between patients' level of knowledge and their demographic data**, the results of the current study revealed that there were positive statistically significant differences between patients' level of knowledge mean scores and patients' age, level of education, and marital status. It was observed that illiterate patients scored as the lowest score in diabetes knowledge, and those with secondary education got the highest score in diabetes knowledge. These results may be due to, better-educated people are more curious while being counseled on diabetes. Besides, it is possible that educated patients could gather more information about the disease from different sources like the internet and magazine. These findings were in agreement with Bukhsh et al. (2018), and Alemayehu et al. (2020), reported that patients' knowledge was correlated significantly with the level of education.

Moreover, the present study revealed that older patients had more scores of diabetes knowledge. It could have been due to the relatively small number of young participants. These results were contradicted Zowgar et al. (2018), and Alemayehu et al. (2020), reported that better diabetes knowledge was associated with younger age. In addition, the current study shows that married patients had more scores of diabetes knowledge. They may acquire better knowledge because those patients had stabilized social relationships, powerful and willing to learn some related methods of self-management. These results were similar to Mahzari et al. (2022), revealed that married patients had higher knowledge. While these results contradicted Zowgar et al. (2018), reported that diabetes knowledge had no significance with marital status

Concerning **the relationship between patients' self-care practices means scores and their demographic data**, the current study revealed that there were positive statistical significant differences between patient's self-care practices mean scores and patients' age, sex, level of education, occupation, and marital status, it was observed that patients with secondary school education had good self-care practices, and the old age had fair practices in comparison with young age. This might suggest that a higher level of education may contribute to improved diabetes knowledge, which is in turn linked with enhanced self-care practices. Also, older patients may have more attention from healthcare providers. So, the patients might adhere to self-care practices based on the information they received from healthcare providers during follow-up visits and learning from day-to-day life experiences. As well as, the current study shows that married patients had more scores in self-care practices, this may because those patients had stabilized social

relationships and powerful willing to learn some related methods of self-management.

These results agreed with Weledegebriel et al. (2021), and Bhatti et al. (2018), proved that sex, age, marital and educational status, and occupation had significant associations with self-care practices. While the finding of the present study contradicted Khaliq et al. (2019), revealed that there were insignificant relationships between demographic factors, including age, gender, marital status, and rural background of patients with self-care practices.

Finally, there were positive statistically significant differences found between patients' practice mean scores and their level of knowledge. It was observed that the highest percentage of the studied patients who had fair self-care practices, had good level of knowledge. These results may be due to that, knowledge is one of the main factors contributing to good self-care practices These results in line with Weledegebriel et al. (2021), revealed that knowledge about diabetes was significantly associated with self-care practices.

Conclusion:

Based on the findings of the present study, it can be concluded that: more than half of the studied patients had a fair level of knowledge, in addition, more than half of the studied patients had a fair level of self-care practices. Most of the studied patients had poor knowledge and self-care practices regarding physical activity. There were positive significant statistical differences between patients' level of knowledge mean scores and the patients' age, level of education and marital status. In addition to, there was statistically significant relation was found between the total patients' self-care practices mean scores and patients' age, level of education, occupation and marital status. Moreover, there were statistically significant differences found between patients' practice mean scores and their level of knowledge.

Recommendations:

Based on the findings of this study the following recommendations are suggested:

Recommendations for patients:

- Development of health education programs for patients and their families to improve their knowledge about therapeutic regimen.
- Increased patient's awareness about diabetes mellitus type 2 and their therapeutic regimen through mass media.

Recommendations for further studies:

- Specialized survey should be done to explore barriers associated with diabetes management, including patients healthcare providers and health systems related barriers.
- Impact of educational program on patients' knowledge and self-care practices.

Table (1): Percentage distribution of the studied patients according to socio-demographic data (n=150)

Socio-demographic data	No.	%
Age(years):		
20–	3	2.0
30–	13	8.7
40–	37	24.7
50 – 60	97	64.7
Sex:		
Male.	59	39.3
Female.	91	60.7
Level of education:		
Illiterate.	66	44.0
Reads and writes.	26	17.3
primary.	9	6.0
Preparatory.	7	4.7
Secondary.	38	25.3
University.	4	2.7
Occupation:		
Manual work.	18	12.0
Professional work.	33	22.0
Housewife.	79	52.7
Retired.	8	5.3
No work.	12	8.0
Religion:		
Muslim.	145	96.7
Christian.	5	3.3
Marital status:		
Single.	2	1.3

Married.	124	82.7
Widow.	24	16.0
Divorced.	0	0.0
Area of residence:		
Urban.	37	24.7
Rural.	113	75.3

Table (2): Frequency distribution of the studied patients according to their clinical data (n=150)

Clinical data	No.	%
Duration of disease (years):		
> 5–	69	46.0
10–	32	21.3
15–	25	16.7
20 years or more.	24	16.0
Medications:		
-Insulin.	74	49.3
-Hypoglycemic tablets.	62	41.3
-Both.	14	9.3
Presence of other chronic diseases:		
-Yes.	125	83.3
-No.	25	16.7
Name of other chronic diseases: #		
-Hypertension.	91	60.7
-Heart disease.	17	11.3
-Hepatic disease.	13	8.7
-Renal disease.	3	2.0
-Neurological disease.	18	12.0
-Other.	6	4.0
Medical visit reason:		
-Follow up.	82	54.7
-Health problems.	**68**	**45.3**
Family history of diabetes:		
-Yes.	101	67.3
-No.	49	32.7
Are you a smoker?		
-Yes.	**31**	**20.7**
-No.	119	79.3
BMI (kg/m^2)		
Min. – Max.	0.63 – 1.86	
Mean ± SD.	1.66 ± 0.10	
Median	1.65	

Table (3): Percentage distribution of the studied patients according to their level of knowledge (n=150)

	Poor (<50%)		Fair (50–75%)		Good (>75%)		Total score			% Score
	No.	%	No.	%	No.	%	Min. – Max.	Mean ± SD.	Median	Mean ± SD.
Diabetic patient's level of knowledge	11	7.3	80	53.3	59	39.3	8.0 – 26.0	18.57 ± 3.77	19.0	71.44 ± 14.48

Table (4): Percentage distribution of the studied patients according to their level of self-care practices (n=150)

Self-care practices	Total Score			% Score
	Min. – Max.	Mean ± SD.	Median	Mean ± SD.
Medication	1.0 – 4.0	2.69 ± 1.45	4.0	53.87 ± 28.94
Diet	0.0 – 6.0	1.93 ± 1.83	1.0	27.52 ± 26.12
Exercise	0.0 – 5.0	0.80 ± 1.37	0.0	16.0 ± 27.42
Blood sugar test	0.0 – 3.0	1.57 ± 0.69	2.0	52.44 ± 22.96
Skin care	0.0 – 4.0	2.22 ± 0.95	2.0	55.50 ± 23.86
Foot Care	1.0 – 13.0	10.50 ± 2.69	11.0	80.77 ± 20.67
Mouth Care	0.0 – 3.0	1.19 ± 0.55	1.0	29.83 ± 13.80
Complications	1.0 – 2.0	1.74 ± 0.44	2.0	87.0 ± 22.01
Follow up	0.0 – 2.0	1.03 ± 0.99	1.50	51.33 ± 49.48
Overall Self-care practices	**6.0 – 37.0**	**23.67 ± 5.99**	**23.0**	**52.61 ± 13.31**

Table (5): Relation between the overall score of the level of knowledge and socio-demographic data (n=150)

Socio-demographic data	% score knowledge						Total (n=150)		Mean score Mean ± SD.	χ^2(p)
	Poor (<50%) (n=11)		Fair (50 – 75%) (n=80)		Good (>75%) (n=59)					
	No.	%	No.	%	No.	%	No.	%		
Age (years):										
20–	1	9.1	0	0.0	2	3.4	3	2.0	75.64 ±32.2	
30–	0	0.0	7	8.8	6	10.2	13	8.7	75.74±16.42	15.289*
40–	1	9.1	14	17.5	22	37.3	37	24.7	75.47±14.08	(^{MC}P=0.008*)
50 – 60	9	81.8	59	73.8	29	49.2	97	64.7	69.19±13.47	
Sex:										
Male.	5	45.5	27	33.8	27	45.8	59	39.3	73.47±15.36	2.240
Female.	6	54.5	53	66.3	32	54.2	91	60.7	70.12±13.81	(0.326)
Level of education:										
Illiterate.	9	81.8	55	68.8	2	3.4	66	44.0	62.53±11.94	
Reads and writes.	2	18.2	19	23.8	5	8.5	26	17.3	68.93±13.10	
Primary.	0	0.0	4	5.0	5	8.5	9	6.0	74.79±11.72	120.765*
Preparatory.	0	0.0	1	1.3	6	10.2	7	4.7	85.16±13.59	(^{MC}p<0.001*)
Secondary.	0	0.0	1	1.3	37	62.7	38	25.3	83.0±6.55	
University.	0	0.0	0	0.0	4	6.8	4	2.7	93.27±5.77	
Occupation:										
Professional work.	3	27.3	14	17.5	16	27.1	33	22.0	70.98±16.60	
Manual work.	2	18.2	7	8.8	9	15.3	18	12.0	76.28±17.11	
Housewife.	6	54.5	49	61.3	24	40.7	79	52.7	69.13±12.96	7.569
Retired.	0	0.0	4	5.0	4	6.8	8	5.3	76.92±14.97	(^{MC}p=0.406)
No work.	0	0.0	6	7.5	6	10.2	12	8.0	76.92±11.0	
Marital status:										
Single.	0	0.0	0	0.0	2	3.4	2	1.3	86.54±13.60	
Married.	9	81.8	62	77.5	53	89.8	124	82.7	71.84±14.44	9.130*
Widow.	2	18.2	18	22.5	4	6.8	24	16.0	68.11±14.28	(0.031*)
Area of residence:										
Urban.	2	18.2	17	21.3	18	30.5	37	24.7	74.32±12.06	1.835
Rural.	9	81.8	63	78.8	41	69.5	113	75.3	70.49±15.12	(0.400)

Table (6): Relation between the overall score of Self-care practices and socio-demographic data (n=150)

Socio-demographic data	% score Self-practice						Total (n=150)		Mean score Mean ± SD.	χ^2(^{MC}P)
	Poor (<50%) (n=66)		Fair (50 – 75%) (n=79)		Good (>75%) (n=5)					
	No.	%	No.	%	No.	%	No.	%		
Age (years):										
20–	0	0.0	2	2.5	1	20.0	3	2.0	66.67±12.37	
30–	5	7.6	6	7.6	2	40.0	13	8.7	56.75±17.54	16.865*
40–	13	19.7	22	27.8	2	40.0	37	24.7	57.54±15.69	(0.004*)
50 – 60	48	72.7	49	62.0	0	0.0	97	64.7	49.74±10.71	
Sex:										
Male.	17	25.8	42	53.2	0	0.0	59	39.3	55.78±12.51	14.378*
Female.	49	74.2	37	46.8	5	100.0	91	60.7	50.55±13.47	(0.001*)
Level of education:										
Illiterate.	38	57.6	27	34.2	1	20.0	66	44.0	0.44±0.53	
Reads and writes.	13	19.7	13	16.5	0	0.0	26	17.3	0.50±0.51	27.361*
Primary.	6	9.1	3	3.8	0	0.0	9	6.0	0.33±0.50	(^{MC}p<0.001*)
Preparatory.	0	0.0	7	8.9	0	0.0	7	4.7	1.0±0.0	

Secondary.	9	13.6	26	32.9	3	60.0	38	25.3	0.84±0.55	
University.	0	0.0	3	3.8	1	20.0	4	2.7	1.25±0.50	
Occupation:										
Professional work.	11	16.7	22	27.8	0	0.0	33	22.0	0.67±0.48	
Manual work.	5	7.6	13	16.5	0	0.0	18	12.0	0.72±0.46	
Housewife.	46	69.7	30	38.0	3	60.0	79	52.7	0.46±0.57	20.241*
Retired.	2	3.0	6	7.6	0	0.0	8	5.3	0.75±0.46	(MCp=0.004*)
No work.	2	3.0	8	10.1	2	40.0	12	8.0	1.0±0.60	
Marital status:										
Single.	1	1.5	0	0.0	1	20.0	2	1.3	62.22±25.14	8.935*
Married.	51	77.3	69	87.3	4	80.0	124	82.7	52.99±13.59	(0.046*)
Widow.	14	21.2	10	12.7	0	0.0	24	16.0	49.81±10.75	
Area of residence:										
Urban.	16	24.2	20	25.3	1	20.0	37	24.7	54.29±13.43	0.127
Rural.	50	75.8	59	74.7	4	80.0	113	75.3	52.06±13.28	(1.000)

SD: **Standard deviation** χ^2: **Chi-square test** FE**: Fisher Exact** MC: **Monte Carlo**

*: Statistically significant at $p \leq 0.05$

Table (7): Relation between the overall score of level of Knowledge and Self-care practices (n=150)

Self-practice	Total (n=150)		Level of knowledge						χ^2	MCP
			Poor (<50%) (n=11)		Fair (50 – 75%) (n=80)		Good (>75%) (n=59)			
	No.	%	No.	%	No.	%	No.	%		
Poor (<50%)	66	44.0	8	72.7	44	55.0	14	23.7	18.588*	<0.001*
Fair (50–75%)	79	52.7	3	27.3	35	43.8	41	69.5		
Good (>75%)	5	3.3	0	0.0	1	1.3	4	6.8		

χ2: Chi-square test MC: Monte Carlo *: Statistically significant at $p \leq 0.05$

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