Coping Obstacles among Patients with Type 2 Diabetes: A Cross-Sectional Study

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Abstract

Background: Management of diabetes requires a complex treatment plan and lifestyle changes to enhance patient adherence toward treatment. However, in patients with type-2 diabetes, living with the disease faces various obstacles. If these obstacles are not recognized, non-compliance with recommended self-care treatments and complications may occur as a result. **Aim:** To determine the coping obstacles among type 2 diabetic patients. **Methods:** A cross-sectional research design was conducted at diabetic outpatient clinics affiliated to El Mahalla El Kubra general hospital. Sample: A purposive sample of 570 patients were included and data collected by interviewing questionnaire to assess socio-demographic, clinical data and diabetes obstacles questionnaire for 5 months from beginning of October 2021 to end of February 2022. **Results:** The studied subjects had obstacles with medications subscales, self-monitoring, and knowledge & believe, diagnosis, life style and coping subscales with mean score 5.17± 6.09, 3.53± 3.47, 5.03± 4.76, 4.38± 5.18, 3.44± 5.66 and 4.14± 3.69 respectively. On the other side, the studied subjects didn't experience obstacles in receiving guidance or supporting and relationship with health care sub-scales with mean scores -5.08± 7.10 and -2.73± 6.02 respectively. **Conclusion:** There are several obstacles faced by patients with type 2 diabetes, the total mean scores of the obstacles were influenced by educational level, occupational status, smoking habit, follow-up, practicing exercises, dietary compliance, diabetes complications, and duration of disease. **Recommendation:** Expanding in the application of the educational programs for diabetic patients which include health information and practical skills to cope with their disease and lifestyle changes.

Keywords: Coping, Obstacles, Type 2 Diabetes Mellitus

Introduction

Diabetes mellitus (DM) is a metabolic disorder in which the metabolism of carbohydrates, fats and proteins is disturbed due to deficiency of insulin or decreased sensitivity of tissues to insulin. In type 2 diabetes, the risk of many other diseases is higher, such as cardiovascular disease and cerebrovascular stroke, hypertension, retinopathy, blindness, nephropathy, and neurological disease, and it is only to be expected. due to increasing inactivity and obesity. Reducing everyday obstacles to diabetes management can improve the disease management **(Muz, et al., 2021).**

Diabetes is a major global threat to public health and it is become an increasingly important health problem today due to its frequency, complications, affects all age groups and causes negative consequences. Also, the rapid changes in lifestyles increase the prevalence of type 2 diabetes rapidly in particular the entire developed and developing countries. Approximately ninety percent of all diabetic persons suffer from type 2 diabetes. It is reported that there are 463 million people diagnosed with diabetes in the world in 2019, and this number will increase to 578 million in 2030 and 700 million in 2045.1 Diabetes is among the top 10 causes of death in adults and was estimated to cause 4 million deaths worldwide in 2017 **(Istek & Karakurt, 2016; Muz , et al., 2021)**.

In Egypt, diabetes is an important public health problem and the disease is considered a modern pandemic worldwide. The prevalence of diabetes continues to rise, which raises serious concerns. According to the International Diabetes Federation, the prevalence of diabetes in Egyptian adults is 15.2%, which may be an underestimation. Therefore, diabetes needs to be thoroughly investigated with respect to its risk factors,

prevention, treatment and consequences. In addition, the general population should be aware and knowledgeable about all aspects of diabetes (**Hegazi, et al., 2015).**

Diabetes affects all aspects of the person's life. Management of DM requires a complex treatment regimen and lifestyle changes to improve adhere to treatment. Behavioral changes are the basis of treatment for chronic diseases, and failure to adhere to treatment is a common problem in patients with type-2 diabetes. Similar to patients other with chronic conditions, patients with DM have poor adherence to treatment. For instance, out of seventeen chronic diseases, diabetes is in the second rank in terms of low adherence to treatment. Therefore, diabetes is the second leading cause of hospitalization due to non-adherence to treatment (**Haji-Arabi, et al., 2018).**

Management of type 2 DM is a lifelong process that requires continuous efforts, both from the physicians and patients. Patients need to follow their medication, meal plans, adjust their physical activity, lose weight if they are obese and monitor their blood glucose. As well as patients must be proficient to successfully manage, maintain lifestyle changes and make daily decisions to meet their objectives while health care providers have the responsibility to help patients to make the right decision and cope with the difficulties and barriers through education, support and advice (**Al-Qazaz, et al., 2011)**

In patients with type 2 DM, living with the disease face various obstacles. Poor diet, lack of physical activities, and poor self-monitoring of glucose levels are some of the most common obstacles faced by DM patients identifying obstacles that prevent adherence to diabetes management recommendations enables the planning of personalized diabetes education and provides guidance for better diabetes management (**Orhan & Karabacak, 2016).** If obstacles to self-management are not identified, failure to adhere to recommended self-care treatments and complications such as hypoglycemia, deterioration in well-being, and quality of life may result. Reducing obstacles to disease adaptation in diabetics can improve management efficacy and related health outcomes (**Cimo & Dewa, 2018).**

The process of coping to type 2 DM and successful individual management depends on the development of strategies for positive life changes to be made to identify and reduce the obstacles faced by patients in the treatment and care process. It is thought that by reducing the obstacles encountered in diabetes management, the risk of developing complications will decrease, and the individual's adherence to treatment and quality of life will increase (**McBrien, et al., 2017).** Health care personnel, especially nurses, who have an important role in the health team, have many responsibilities in ensuring and increasing individual compliance with treatment. Among these roles and responsibilities, the continuous education of the individual diagnosed with diabetes and the follow-up at the end of the education has an important place (**Blonde, et al., 2017).**

Nurses combine science and art to provide health services and actively involved in prevention and early detection of DM and its complications. The nurses' role could be in health care, community education, health systems management, patient care and improving the quality of life. Since patient's care is the first duty of nurses, so that they play an important role in the care of patients with DM (**Alshammari, 2021**). Moreover, nurses have crucial role in identifying and eliminating the obstacles faced by type 2 DM patients. In order to determine the obstacles faced by type 2 DM patients, nurses should assess the problems experienced by the patients in terms of drug use, unwanted side effects of the drugs, the problems experienced in measuring blood glucose levels, lifestyle changes experienced of the patients and support systems (**Adu, et al., 2019**) . So, this study was carried out to determine the obstacles experienced by patients with 2 DM in coping with their illness**.**

Significant of the study

Type 2 diabetes patients had various obstacles with regard to medication, self-monitoring, lack of correct knowledge, relationships with medical experts, lifestyle changes, managing diabetes, and getting assistance and support (**Vicdan, & Yapar, 2020**). A thorough understanding of the specific barriers of DM patients will provide greater clarity on the factors

affecting quality of life associated with the disease and coping with daily life. However, patients often face obstacles to successful monitoring that may delay optimal management of the disease **(Boussageon, et al., 2014).** Therefore, identifying obstacles facing patients with DM permits the design of individualized diabetes education and offers direction for better diabetes management plan.

Aim of the study:

The aim of this study was to determine the coping obstacles among type 2 diabetic patients.

Research questions:

1. What are the obstacles faced by individuals with Type 2 diabetes in their illness?

2. What is the relation between sociodemographic and medical data with the obstacles faced by individuals with Type 2 diabetes in diabetes?

Subjects and Method

Research design and setting:

A cross-sectional study was conducted at diabetic outpatient clinic affiliated to El Mahalla El Kubra general hospital. Which are affiliated to the Egyptian Ministry of Health, and has provided free treatment services for their visitors.

Population and sample:

This study was used a purposive sampling technique with total of 570 patients were enrolled in the study and attended at diabetic outpatient clinic during the time of study for 5 months from beginning of October 2021 to end of February 2022. **They were selected based on the following criteria:**
- Type 2 diabetes patients, from both genders, cooperative and willing to participate in the study.
- Diagnosed as having diabetes at least one year before starting the study.
- They have the ability to communicate verbally.

- Patients with cognitive impairment, visual and auditory problems, were excluded from the study.

Sample size: The sample was based on a previous study **(Fİdan et al., 2020),** considering level of significance of 5%, and power of study of 80%, based on data from literature and meets the inclusion criteria during the study period. The selection of the sample size was done using the formula:

$$n = \frac{(Z1-\alpha/2)^2 . SD^2}{d^2}$$

Where, $Z_{1-\alpha/2}$ = is the standard normal variate, at 5% type 1 error it is 1.96, SD = standard deviation of variable and d = absolute error or precision. So,

$$n = \frac{(1.96)^2 . (21.72)^2}{(1.784)^2} = 569.4$$

Based on the above formula, the total sample size required for the study is 570 diabetic patients.

Data collection tool:

The researchers were used an interview questionnaire that consisted of three parts for collecting data from diabetic patients

First part "Socio- demographic data"

This part was developed by the researchers based on review of relevant literature to assess socio-demographic data for the participants as age, gender, and marital status, level of education, occupation, monthly income, residence, and persons living together.

Second part "clinical data"

This part was developed by researchers to assess the details about clinical data which include smoking habit, duration of DM, presence of another chronic disease, type of treatment, diabetes follow up, measurement of blood glucose, practice of exercise, dietary compliance, diabetes complications, as well as previous hospitalization in the last year. This assessed the details of the present illness such as presence of another chronic disease, types of treatment, diabetes follow up, diabetes complication, duration of diabetes, type of diabetes treatment and diabetes follow-up status, practice of exercises, compliance with

diabetes treatment, complications of diabetes, and the frequency of hospitalization over the past year.

Third part "Diabetes obstacles questionnaire" (DOQ).

It was adapted from **(Hearnshaw et al., 2007)** and then translated into simple Arabic language which consisted of eight subscales with 78 questions. The subscales were include medication obstacles (ten items), self-monitoring (five items), knowledge and belief obstacles (ten items), obstacles in diagnosis (six items), obstacles in the relationship with health care professionals (eighteen items), lifestyle changes (thirteen items), obstacles in coping with diabetes (eight items), and obstacles in receiving guidance and support (eight items). Each of the subscales is graded on a 5-point Likert scales "Strongly Disagree (= -2), Disagree (-1), Neutral (= 0), Agree (+1), and Strongly agree (+2)" The average score for each subscale was added together to obtain the total scale score .

The values of each item on the scale range from -2 to +2. Based on the average results of the questionnaire's subscales, evaluation is conducted. Positive results show that the patients were had obstacles in the relevant area, whereas negative values show that they had not. The average scores were obtained for each subscale reflects the degree of obstacles faced by the participants.

Validity & reliability

The researchers confirmed the tool's content validity before beginning data collection, the study tool was submitted to a jury composed of five experts in the area of specialty. They were asked to judge completeness and accuracy of the content to the tool and the necessary modifications were done. Furthermore, the time needed to fill in the data sheet was estimated. For the Arabic version of this questionnaire, the reliability was tested utilizing Cronbach's alpha test, the value of the reliability (internal consistency) of the diabetes obstacles questionnaire was 0.755.

Fieldwork:

The current study was conducted in two phases which include Preparatory phase, and implementation phase.

A Preparatory Phase:
- This includes review of relevant literature, various studies, and theoretical knowledge of various aspects of the research problem using books, articles, internet, journals and then the study tool was developed.
- Arabic translation of the study tool was done by the researchers.
- Permission was done from responsible authority of selected hospitals.
- The researcher then met with the outpatient director and nursing director to explain the aim of the study and gain their cooperation.
- Pilot study was done on 10% of study sample by the researcher, these patients will not be included in the study sample.

Implementation phase :
- Oral consent from the participants was taken after explaining the purpose and the nature study.
- The researcher attended to the outpatient clinic 2 days weekly and stay (from 9.00 am to 2.00 pm).
- The Type 2 diabetes patients who fulfilled the inclusion criteria were selected to participate in the study.
- The researcher collected the study data by using face-to-face interviews, each patient was met individually in a private room in outpatient clinics to collect the necessary data; it took about 20 minutes for data collection.
- Data was collected for 5 months from beginning of October 2021 to end of February 2022 in the previous mentioned setting.

Administrative and ethical considerations
- The data collection took place in collaboration with director of diabetic outpatient clinics affiliated to El Mahalla El Kubra general hospital. Permission was done from responsible authority before starting the study.
- The researchers got an approval of the study protocol by the Research Ethics Committee in the Faculty of Medicine Kafrelsheikh University.
- The study was conducted according to the Declaration of Helsinki principles. An informed consent was obtained from each participant after having full information

about the study aim, and about their rights. The anonymity and confidentiality of any obtained information was secured. The collected data was used for the research only.

Statistical analysis

IBM SPSS 25.0 package program was used for statistical analysis of the data. The conformity of the data to the normal distribution was evaluated with the Shapiro–Wilk test of normality and the homogeneity of the variances with the Levene test. In the analysis of the data, percentage, mean, and standard deviation from descriptive statistics, Qualitative data were provided as a number and a percentage. It was examined utilizing a student -t test in independent samples were used for comparisons, and covariance was analyzed using "one-way ANOVA", $p \leq 0.05$ value was considered statistically significant.

Results

Table (1): Shows sociodemographic characteristics of the studied subjects, it illustrations that the mean age of the patients was 46.69±8.09 years, 58.8% were female, 64.6% were married, and 27.7% were illiterate and 33.2% were housewives and 51.2 % of them had insufficient income as well as 63.9% came from urban areas.

Table (2): Clarifies that 60.0% of the studied subjects were nonsmokers. Regards duration of the disease, 53.9% of patients had a diabetes for 1 to 4 years, 57.0% of them had other chronic diseases besides diabetes, 55.3% of them were taking oral hypoglycemic tablets for the treatment of diabetes, and 58.9% of them had irregular follow up of diabetes. 50.4% of the studied subjects measured blood glucose regularly. In relation to practicing exercises 68.8% of them did not practice exercises. It also shows that 53.0% of the studied subjects moderately complied with diabetic diet, Neuropathy was the most frequently noted by 33.0%, of the total complications. 57.7% of the studied subjects had not admitted to the hospital in the last year whereas 28.1% had hospitalized once within the previous year.

As observes in **(Table 3)**, the studied subjects had obstacles with medications subdimensions, self-monitoring, knowledge &

believe, diagnosis, life style and coping subdimensions with mean score 5.17± 6.09, 3.53± 3.47, 5.03± 4.76, 4.38± 5.18, 3.44± 5.66, 4.14± 3.69 respectively. On the other side the studied subjects didn't experience obstacles in receiving guidance, support and relationship with health care sub-scales with mean scores -5.08± 7.10 and -2.73± 6.02 respectively. The total means score of the overall DOQ was 17.92± 18.59.

Table (4) Highlights that there was statistically significant relation between age groups were examined and DOQ mean scores; it was found that the age group between 50 to 60 faced more obstacles in the sub-dimensions of knowledge and diagnosis compared to the other age groups (P<0.05). A significant relation was found between marital status and medications and knowledge & believes obstacles sub-dimensions. It was determined that married patients faced fewer obstacles than single, widow, divorced patients. It also was identified that the illiterate patient in the sub-dimension of medication, knowledge, diagnosis, coping obstacles faced more obstacles than the secondary educated patients (P<0.05).

There was statistically significant relation between the mean scores of the medication, knowledge & believes, diagnosis, health life style and getting support obstacles subdimensions in regards of the occupation. Regarding monthly income there was significant relation between monthly income and DOQ mean scores, as well patients with insufficient income faced more obstacles in sub-dimensions of medication, knowledge and relationship with health care sub-dimensions. Regarding to total mean scores of DOQ, it was observed that level of education, occupational status and monthly income had a significant relation with the total mean scores of DOQ.

Table (5) Illustrations that smoker patients faced more obstacles in medication obstacles sub-dimensions (P ≤ 0.05). Another relation between presence of another chronic disease beside DM and the medication obstacle subdimension (P≤ 0.05). Concerning the type of treatment, it was found significant relation between type of treatment and

knowledge and coping obstacles subdimension (P ≤ 0.05). In addition, it was identified that patients did not measure blood glucose regularly faced more obstacles in medication, knowledge, diagnosis and support obstacles sub-dimensions (p ≤ 0.05). Also, it was found that patient did not practicing exercise faced more obstacles in sub-dimensions of medication, knowledge, and life style obstacles. It was determining that patients that did not comply with the diabetic diet faced more obstacles in sub-dimensions of medication, self-monitoring and knowledge, and life style obstacles (p≤0.05).

There was statistically significant relation between the mean scores of medications, self-monitoring, diagnosis, health relation, life style and coping subdimensions regarding diabetic complications (p≤0.05). Also, it was observed that the previous patients hospitalize for ≥ 2 times in the last year faced more obstacles in medication and coping obstacles (p ≤ 0.05).

In addition, it was found that the patients did not follow up regularly faced more obstacles related to medication, diagnosis and support obstacles (p ≤ 0.05). Moreover, there were statistically significant relation between medication, self-monitoring and knowledge, diagnosis, life style and support obstacles regarding the duration of the disease, this difference was found in patients with disease duration ten years and more (p ≤ 0.05).

Regarding to the total mean scores of DOQ, it was noticed type of treatment and presence of another chronic disease beside DM had no significant relation with the total mean scores of DOQ, while smoking habit, follow up of DM, regular measurement of blood glucose level, practicing exercises, compliance with diabetic diet, presence of diabetes complications and duration of the disease had a significant relation with the total mean scores of DOQ.

Table (1): Frequency Distribution of Clinical Data of the Studied Subjects (n=570)

Items	N=570	%
Age/years	46.69±8.09 31-60	
Age		
- 30< 40	141	24.7
- 40< 50	197	34.6
- 50-60	232	40.7
Gender		
- Male	235	41.2
- Female	335	58.8
Marital status		
- Single	70	12.3
- Married	368	64.6
- Divorced	86	15.1
- Widow	46	8.1
Level of education		
- Illiterate	158	27.7
- Read and write	142	24.9
- Primary school	89	15.6
- Secondary school	113	19.8
- University	68	11.9
Occupational status		
- Employee	123	21.6
- Housewife	189	33.2
- Free work	128	22.5
- Retired	7	1.2
- Not working	123	21.6
Monthly income		
- Sufficient and save	84	14.7
- Sufficient	194	34.0
- Insufficient	292	51.2
Residence		
- Urban	364	63.9
- Rural	206	36.1

Table (2): Frequency Distribution of Clinical Data of the Studied Subjects (n=570)

Items	N=570	%
Smoking habit		
- Yes	228	40.0
- No	342	60.0
Duration of DM/years		
- **1-4**	307	53.9
- **5-9**	167	29.3
- **10 years and more**	96	16.8
Presence of another chronic disease		
- Yes	325	57.0
- No	245	43.0
Type of treatment		
- Oral medication	315	55.3
- Insulin	202	35.4
- Oral medication + insulin	53	9.3
Diabetes follow up		
- Regular	234	41.1
- Irregular	336	58.9
Measurement of blood glucose		
- Yes	287	50.4
- No	283	49.6
Exercise		
- Yes	178	31.2
- No	392	68.8
Dietary compliance		
- Good	178	31.2
- Moderate	303	53.2
- Bad	89	15.6
Diabetes complications		
- Non	29	5.1
- Retinopathy	101	17.7
- Nephropathy	188	33.0
- Neuropathy	123	21.6
- Diabetic foot	82	14.4
- Other	47	8.2
Hospitalization in the last year		
- None	329	57.7
- Once	160	28.1
- ≥ 2 times	81	14.2

Table (3): Mean Score of Overall and Subscale of Diabetes Obstacles Questionnaire among the Studied Subjects (n=570).

Items	Median (min-max)	Mean± SD
Medications obstacles	3(-15,19)	5.17± 6.09
Self-monitoring	3(-10,10)	3.53± 3.47
Knowledge & believes obstacles	4(-13,19)	5.03± 4.76
Diagnosis obstacles	1(-7, 12)	4.38± 5.18
Relationship with health care	0(-21,18)	-5.08± 7.10
Life style obstacles	2(-8, 21)	3.44± 5.66
Coping obstacle	4(-7,12)	4.14± 3.69
Obstacles in receiving guidance and support	0(-12,8)	-2.73± 6.02
Total obstacles	16.5(-35, 68)	17.92± 18.59

SD: Standard deviation

Table (4): Relation Between Mean Scores of the DOQ and Socio-demographic Characteristics of the Studied Subjects (n=570).

Items	Medications obstacles Mean± SD	Self-monitoring Mean± SD	Knowledge & believes obstacles Mean± SD	Diagnosis obstacles Mean± SD	Relationship with health care Mean± SD	Life style obstacles Mean± SD	Coping obstacle Mean± SD	Guidance & support obstacles Mean± SD	Total obstacles Mean± SD
Age/years									
30< 40	5.24±5.99	3.02±3.26	4.49±4.72	4.56±4.85	-6.00±6.66	2.48±5.47	4.62±2.72	-2.51±6.09	15.92±17.14
40<50	5.61±6.56	3.32±3.46	4.67±4.67	3.80±5.75	-4.44±6.40	3.56±5.11	3.82±3.95	-2.67±6.15	17.69±19.75
50-60	4.76±5.73	4.02±3.57	5.68±4.83	5.77±4.83	-5.08±7.68	3.87±6.19	4.12±3.95	-2.93±5.88	19.22±17.69
F	1.05	4.16	3.36	1.97	1.98	2.74	1.92	0.230	1.42
P=	0.350	0.016*	0.027*	0.140	0.139	0.06	0.14	0.795	0.242
Gender									
Male	5.20± 5.87	3.50±3.65	4.77±4.72	4.85±5.08	-5.69±7.14	3.22±5.74	4.22±3.62	-3.08±6.14	17.00±17.55
Female	5.15± 6.24	3.55±3.35	5.22±4.80	4.06±5.24	-4.66±7.06	3.56±5.64	4.08±3.74	-2.49±5.93	18.49±18.99
t	-0.189	0.081	-1.09	1.78	-1.70	-0.694	-0.419	-1.051	-0.955
P=	0.850	0.936	0.276	0.075	0.088	0.488	0.675	0.250	0.340
Marital status									
Single	6.54± 5.93	3.34±4.12	4.66±4.75	4.20±5.10	-4.42±6.32	5.04±5.36	3.92±3.58	-1.91±5.93	19.81±20.2
Married	4.57± 5.99	3.54±3.39	4.32±4.98	4.33±5.29	-5.03±7.40	3.18±5.71	4.09±3.62	-2.79±6.14	16.66±18.70
Divorced	5.29± 5.98	3.34±3.16	6.94±3.62	5.00±4.88	-4.62±6.93	3.17±6.02	4.12±4.43	-3.08±5.76	20.59±15.54
Widow	7.67± 7.75	4.10±3.70	5.54±5.56	3.93±5.1	-7.39±5.73	3.30±4.94	4.86±2.78	-2.86±5.73	19.60±17.92
F	5.05	0.570	6.16	0.577	1.94	2.18	0.690	0.548	1.55
P=	0.002*	0.635	<0.001*	0.644	0.121	0.089	0.558	0.650	0.199
Level of education									
Illiterate	5.60± 5.73	3.30±3.34	5.77±4.56	5.36±4.44	-4.61±6.99	3.53±6.87	4.31±3.64	-2.96±5.47	20.31±15.92
read and write	5.31± 6.34	3.90±3.24	5.06±4.45	4.48±5.01	-5.24±6.66	3.37±5.07	4.91±2.69	-3.00±5.95	18.80±17.67
Primary school	5.68± 5.52	3.80±3.71	5.34±4.15	4.51±5.09	-3.79±6.16	3.87±4.83	4.05±3.10	-1.60±6.45	21.88±17.29
Secondary school	3.51± 7.04	2.98±4.04	4.35±5.23	2.87±5.79	-6.05±8.13	3.30±5.27	3.52±3.89	-2.70±6.31	11.79±20.31
University	5..97± 4.94	3.86±2.80	4.01±5.55	4.27±5.70	-5.94±7.41	2.85±5.59	3.27±5.05	-3.17±6.27	15.14±20.90
F	2.79	1.581	2.41	3.90	1.70	0.341	3.44	1.005	5.71
P=	0.025*	0.178	0.04*	0.004*	0.148	0.850	0.009*	0.405	<0.001*
Occupational status									
- Employee	4.08±6.65	3.05±3.78	4.13±5.81	3.17±5.64	-5.34±8.32	2.91±5.65	4.04±4.40	-3.25±6.09	12.79±21.16
- Housewife	5.20±6.68	3.88±3.36	5.71±4.37	3.98±5.16	-4.71±6.76	4.04±6.02	4.30±3.69	-2.47±5.73	19.95±17.76
- free work	5.48±5.16	3.67±3.80	4.39±5.25	4.67±5.48	-5.38±7.38	4.18±5.24	3.78±3.47	-4.17±5.97	16.67±18.70
- Retired	-1.28±10.01	0.71±5.87	7.85±2.34	4.57±5.25	-7.14±3.07	-	5.42±2.87	-5.00±5.38	3.42±20.86
- not working	6.27±4.72	3.47±2.64	5.40±3.34	5.91±3.93	-4.96±6.15	1.28±5.37 2.44±5.38	4.29±3.14	-1.00±6.06	21.84±14.10
F	4.13	2.30	3.51	4.895	0.436	3.55	0.672	5.07	5.77
P=	0.003*	0.057	0.008*	0.001*	0.783	0.007*	0.612	0.001*	<0.001*
Monthly income									
Sufficient and save	3.91±6.64	3.17±3.71	2.10±5.33	3.35±5.95	-4.97±6.34	3.46±5.43	3.67±4.46	-1.86±5.78	12.85±22.31
Sufficient	4.89±6.51	3.59±3.39	5.39±4.21	4.38±5.23	-6.08±7.28	3.38±6.15	4.31±3.31	-2.49±6.05	17.40±18.83
Insufficient	5.72±5.56	3.59±3.47	5.64±4.64	4.68±4.88	-4.45±7.14	3.43±5.44	4.16±4.14	-3.15±6.05	19.64±16.57
F	3.21	5.16	20.02	2.15	3.07	0.007	0.889	1.72	4.58
P=	0.041*	0.597	<0.001*	0.116	0.047*	0.993	0.411	0.180	0.011
Residence									
Urban	5.20±6.24	3.38±3.49	4.79±4.85	4.25±5.32	-4.73±7.14	3.69±5.89	4.09±3.81	-2.55±6.32	20.01±16.84
Rural	5.12±5.84	3.62±3.45	5.46±4.39	4.62±4.93	-5.70±7.01	3.00±5.21	4.22±3.48	-2.86±5.82	16.45±19.27
T	0.159	-0.445	-1.61	-0.830	-1.57	1.38	-0.386	0.157	0.242
P=	.874	0.656	0.106	0.422	0.117	0.165	0.700	0.875	0.809
Smoker									
Yes	6.07±5.14	3.78±3.07	4.62±4.82	4.83±5.01	-4.82±7.54	3.79±5.55	4.27±3.61	-2.49±6.30	18.90±16.93
No	4.57±6.59	3.37±3.72	5.31±4.71	4.09±5.28	-5.26±6.80	3.17±5.76	4.05±3.74	-2.90±5.83	17.93±19.62
T	2.89	1.37	-1.68	1.68	0.721	1.28	0.699	0.602	2.27
P=	0.004*	0.169	0.093	0.092	0.471	0.198	0.485	0.548	0.023*

t: Student t-test   F: "One-Way ANOVA test   *: Statistically significant at p ≤ 0.05.

Table (5): Relation between Mean Scores of DOQ and Clinical Data of the Studied Subjects (n=570).

Items	Medication obstacles	Self-monitoring	Knowledge obstacles	Diagnosis obstacles	Health relation ship	Life style obstacles	Coping obstacle	Obstacles support	Total obstacles
Presence of another chronic disease									
- Yes	5.87±5.98	3.46±3.57	5.07±5.15	4.63±5.06	-4.98±6.87	3.17±6.16	4.18±3.49	-2.98±5.97	17.37±19.06
- No	4.64±6.13	3.58±3.40	5.00±4.46	4.20±5.27	-5.16±7.28	3.65±5.25	4.11±3.83	-2.55±6.05	18.30±18.26
T	2.39	-0.415	0.159	0.972	0.291	-0.995	0.223	-0.843	-0.591
P=	0.017*	0.678	0.874	0.331	0.771	0.320	0.823	0.399	0.555
Type of treatment									
- Oral tablets	5.06±5.99	3.76±3.20	5.32±4.45	4.58±5.08	-4.88±7.19	3.51±6.05	3.70±3.69	-2.87±5.93	18.14±18.00
- Insulin + oral	5.25±6.15	3.32±3.77	4.36±5.23	3.91±5.41	-5.54±6.49	3.62±4.98	4.84±3.77	-2.16±5.95	17.65±19.43
- insulin	5.50±6.55	2.98±3.81	5.88±4.49	5.01±4.84	-4.56±8.69	2.35±5.69	4.11±2.67	-4.09±6.63	17.35±19.16
F	0.148	1.70	3.43	1.46	0.690	1.102	5.97	2.36	0.068
P=	0.363	0.182	0.033*	0.232	0.502	0.333	0.003*	0.095	0.935
Diabetes follow-up									
- regular	4.14±6.32	3.29±3.92	4.92±5.02	3.86±5.57	-5.08±7.12	2.96±6.29	3.91±3.71	-3.70±5.93	14.31±20.04
- irregular	5.89±5.82	3.70±2.12	5.11±4.59	4.75±4.86	-5.72±7.02	3.74±5.20	4.30±3.67	-2.06±6.00	20.36±16.77
t	-3.39	-1.40	0.464	-2.01	1.45	-1.60	-1.26	-3.22	-3.90
P=	0.001*	0.162	0.642	0.045*	0.234	0.109	0.208	0.001*	<0.001*
Measurement of blood glucose									
- Yes	4.30±6.34	3.32±3.68	4.04±5.31	3.87±5.62	-5.35±7.49	3.46±5.83	3.85±3.94	-3.48±5.96	13.79±20.61
- No	6.06±5.70	3.74±3.00	6.03±3.89	4.91±4.95	-4.81±6.69	3.43±5.49	4.43±3.40	-1.98±5.99	22.06±15.24
T	-3.47	-1.46	-5.09	-2.41	-0.905	0.068	-1.89	-2.99	-5.43
P=	0.001*	0.145	<0.001*	0.016*	0.366	0.946	0.059	0.003*	<0.001*
Exercise									
- Yes	4.43±6.43	3.48±3.31	4.32±4.88	3.94±5.50	-5.04±6.43	2.74±5.42	4.23±3.81	-2.35±6.14	15.52±19.81
- No	5.65±5.90	3.55±3.55	5.36±4.68	4.58±5.02	-5.10±7.40	3.76±5.74	4.10±3.63	-2.91±5.96	18.98±17.94
T	-2.79	-0.240	-2.42	-1.36	0.097	-1.99	0.376	1.02	-2.06
P=	0.005*	0.810	0.015*	0.172	0.923	0.047*	0.707	0.305	0.039*
Dietary Compliance									
- Good	2.93±7.04	2.70±4.17	3.96±5.20	3.88±5.61	-5.00±7.00	2.93±6.13	3.88±3.77	-2.43±5.87	12.87±22.13
- Moderate	6.00±5.49	3.99±3.12	5.29±4.71	4.73±4.92	-4.96±7.52	3.70±5.54	4.05±3.70	-2.83±6.18	20.00±16.39
- Bad	6.84±4.62	3.64±2.76	6.31±3.49	4.20±5.12	-5.68±5.77	3.42±5.17	4.95±3.39	-3,03±5.79	20.66±14.46
F	19.35	7.95	8.32	1.58	0.394	1.25	2.76	0.372	9.89
P=	<0.001*	<0.001*	<0.001*	0.206	0.688	0.285	0.07	0.690	<0.001*
Diabetes Complications									
- Non	-1.27±7.28	1.24±6.28	5.62±5.28	0.55±6.30	-8.68±5.97	1.31±6.42	2.13±4.61	-5.58±6.00	-4.66±17.59
- Retinopathy	4.62±6.52	3.49±3.53	5.01±5.25	5.48±4.52	-3.15±6.73	4.77±6.45	4.32±3.83	-2.57±5.96	21.99±17.13
- Nephropathy	6.68±5.87	4.29±2.27	5.61±4.14	4.70±4.82	-5.10±4.85	3.14±5.92	4.57±3.09	-1.80±6.24	22.10±13.49
- Neuropathy	3.71±5.60	4.11±3.21	5.45±4.81	5.06±4.89	-6.66±8.69	3.47±5.75	3.52±3.85	-2.98±5.93	15.69±18.72
- Diabetic foot	5.08±5.48	3.12±3.44	4.31±4.27	4.19±5.07	-4.93±6.57	3.69±4.81	4.07±3.17	-1.59±6.31	17.95±18.13
- Other	7.08±5.29	3.52±3.13	4.85±4.74	3.95±5.37	-4.59±6.66	2.74±5.25	4.68±3.57	-2.95±5.82	19.48±17.71
F	13.72	3.99	0.842	4.98	4.51	2.29	3.44	2.23	11.88
P=	<0.001*	0.001*	0.520	<0.001*	<0.001*	.044*	0.004*	0.049*	<0.001*
Hospitalization in the last year									
- None	4.68±5.82	3.42±3.59	5.13±4.69	4.04±5.324.82 ±5.01	-5.01±7.09	3.08±5.31	3.90±3.83	-3.06±6.03	16.12±19.40
- Once	5.58±6.58	3.85±3.19	5.11±4.94		-5.51±7.22	4.02±6.19	3.90±3.43	-2.28±5.85	20.32±18.18
- ≥ 2 times	6.37±6.00	3.34±3.52	4.49±4.73	4.91±4.87	-4.54±6.95	3.77±5.90	4.75±3.45	-2.32±6.28	20.55±16.69
F	3.02	0.929	0.612	1.69	0.550	1.64	3.08	1.11	3.58
P=	0.049*	0.395	0.543	1.85	0.578	0.194	0.047*	0.329	0.028*
Duration of disease/years									
1-4	5.43±6.63	3.71±3.31	2.82±6.03	2.75±5.64	-6.42±8.13	2.96±4.90	3.92±3.82	-4.28±5.65	7.78±21.94
5-9	3.20±6.79	2.37±5.13	5.35±4.14	4.43±5.19	-5.03±6.73	3.07±6.22	4.07±3.54	-2.88±5.98	18.99±16.79
≤ 10 years	5.65±5.41	3.83±2.80	5.72±4.68	5.25±4.68	-4.40±7.08	4.55±6.46	4.95±3.40	-2.17±6.08	21.70±17.72
F	6.195	6.650	13.32	7.27	2.49	4.55	2.90	4.57	19.42
P=	0.002*	0.001*	<0.001*	0.001*	0.084	0.011*	0.055	0.011*	<0.001

t: Student t-test   F: "One-Way ANOVA test"   *: Statistically significant at p ≤ 0.05.

Discussion:

Diabetes and its complications are currently from the leading causes of death in many countries. To successfully manage diabetes, obstacles to coping must be identified to encourage compliance with diabetes standards in self-management and clinical interventions **Muz, et al., (2021).** Therefore, this study was carried out to determine the obstacles experienced by type 2 diabetes patients in coping with their illness.

In relation to study subjects' sociodemographic and clinical data, it revealed that patients' age ranged between 31 to 60 years old with mean of (46.69 ± 8.09) years. Regarding gender, marital status, level of education and occupational status, results of the current study delineated that more than one half of the study subjects were females. The study findings also revealed that the highest percentages of study subjects were married, illiterate and housewives. These results from viewpoints of the researchers, they found that most of the women in the study sample were overweight compared to the men, which is one of the risk factors for type 2 DM with highest percentage of the them were illiterate due to low social status.

This finding is in consistence with a study by **Arslan, et al., (2020)** who stated that more than half of the studied diabetic patients were female. Additionally, in another study that conducted in Sohag city in Egypt by **AlSawahli, et al., (2021),** they concluded that the prevalence of DM in females was significantly higher than in males. This result is in agreement with a study by **Ausili, et al., (2018)** who revealed that more than half of type 2 DM patients were females. According to study results done by, **McCoy, et al., (2021)** who mentioned that, the patients of type 2 diabetes age, 65.6 ±11.8 years; more than half of them were female and married. In the same direction **Papadopoulos, et al., (2007)** reported that, in accordance to socio-demographic data, the most studied subjects were female and the mean age for the entire sample was seventy years which contradicts the results of the current study. Additionally, the majority of them was low educational status, having completed only primary school and most patients were married.

Regarding type of treatment, results of the current study shows that more than one half of the studied subjects were dependent on oral hypoglycemic medications, with irregular diabetes follow up schedule, as well one half of them were measuring blood glucose regularly. In our opinion, the most of the studied subjects have insufficient knowledge regarding the importance of regular diabetes follow up and blood glucose monitoring. These results were in accordance with a study done by **Tan, et al., (2020)** which found that most patients with type 2 DM taking oral hypoglycemic agents to control blood glucose levels. As well as **McCoy & et al. (2021)** who reported that most patients with type 2 DM were taking oral glucose lowering medications without following up their blood glucose levels.

In relation to practicing exercise, the present study shows that more than two thirds of the study subjects weren't having regular exercise while more than one half of them had moderate dietary compliance. Regarding, the presence of complications related to type 2 DM, it was found that nearly one third of the study subjects were suffered from nephropathy. This result can be rationalized as that the studied subjects had low level of knowledge regarding the medications, dietary modification and glycemic control which in turn increase the risk of complications.

This result was supported by **Xie, et al., (2020)** who mentioned that type 2 DM patients were found to be significantly less likely to exercise regularly in addition to, older patients were found to be significantly more likely to have complications and nephropathy represented the major complications among studied subjects. These results are also in agreement with a study done by **Pilv, et al., (2012),** who stated that the most frequently seen complications among studied subjects were macrovascular and nephropathy. In the same line, **Fidan, et al., (2020)** also reported that approximately two-thirds of the studied diabetic patients did not practice exercise regularly and approximately two-thirds of them had moderate adherence to treatment.

Concerning obstacles faced by studied subjects with type 2 DM. According to the results of the current study it was observed that patients with type 2 DM faced the most obstacles in medications followed by knowledge & believes, diagnosis obstacles, coping obstacles, self-monitoring and life style obstacles as well as the total DOQ. This result may due to people who have been diagnosed with diabetes find it challenging to adjust some aspects of their lifestyle changes and compliance with medication, self-monitoring and follow up plan due to nature of chronicity of the disease that in turn increase obstacles of the disease coping. In addition to low socio-economic status for the most studied subjects which represents one of the most important obstacles affecting the treatment plan and follow-up for patients with DM.

This result was confirmed by **Vicdan, & Yapar, (2020)** in their study that revealed that type 2 diabetes patients had several obstacles with their medications, self-monitoring, knowledge and belief, diagnosis, relationship with medical staff, lifestyle changes, coping in managing their diabetes, and getting support. The current finding also supported by **Fidan, et al., (2020),** who stated that the study's participants encountered obstacles with coping with their illness, self-monitoring, disease diagnosis, and changes affecting lifestyle. As well **Byers, et al., (2016)** mentioned that majority of diabetic patients identified barriers to self-management included fear, seeking information and knowledge about the disease, and difficulty making lifestyle changes. On the same direction **Blonde & et al., (2017)** reported that leading reasons for poor glycemic control included poor adherence with lifestyle measures and medication, side effects of therapy, and infrequent clinic attendance for follow up.

On the other side, this result was contradicted with the results of the study that conducted by **Arslan, et al., (2020)** who found that negative means scores for 7 out of the 8 subscales of the DOQ which include medication, self-monitoring, knowledge and believes, diagnosis, relationships with healthcare professionals, lifestyle changes, and obstacles in getting advice and support that patients did not perceive many obstacles in

these areas. The only subscale with a positive mean score was the "barriers in coping with diabetes" subscale, and the patients' impression of difficulties in this area was greater. The difference between the results of the current study and the results of the previous study may be due to that more than half of the studied subjects in the previous study received educational program regarding DM management and the most of them did regular measurement of the blood glucose level, which reflect the importance of educational programs in reducing the obstacles of diabetic patients.

Regarding to the relation between the socio-demographic characteristics and the mean scores of DOQ of the studied subjects, the current study showed that significant relation between age groups were examined; it was found that the age group between 50 to 60 faced more obstacles in the sub-dimensions of knowledge and diagnosis compared to the other age groups. This study finding may be related to chronic diseases and limited income which affects negatively on patient's health and disease management especially in old age patients. This result is agreed with the study done by **Teklay, et al., (2013)** who indicated that increasing the age of the patients with chronic diseases can reduce the compliance of patients to treatment. As well **Voorham, et al., (2011)** found that there was a negative association between increase age over 60 years and suboptimal adherence, and self-monitoring of the disease.

As regards to the gender variable, the current study reported that no significant relation was detected between the gender and the mean scores of the DOQ. This finding was in agreement with **Bhagavathula, et al., (2018)** who stated the same result. On the other hand, this finding is in contrary with a study by **Arslan, et al., (2020),** who found that the gender variable had an impact on the obstacles faced diabetic patient regarding the knowledge and belief subdimension, and female patients had higher obstacles in this area.

Another important finding that, a significant relation was found between marital status and medications, knowledge and believes obstacles sub-dimensions. It was observed that married patients faced fewer

obstacles than single, divorced and widow patients. As well, widowed patients faced more obstacles than other marital status categories. These results from the viewpoint of the researchers, widowed and divorced patients having more responsibilities in their families which makes them having problems in finding time for takes care of themselves, in addition to the load of the work and low income. In the same line, the same rational was obtained by **Zehra, et al., (2014)** who notify that family members help in caring of diabetic patient as they raise patient awareness and facilitate follow the treatment process.

Concerning educational level, there was a significant relation between diabetic obstacles mean sores and the level of education of the studied subjects, it was identified that the illiterate patient in the sub-dimension of medication, knowledge, diagnosis, coping obstacles faced more obstacles than the secondary educated patients. This finding is in agreement with **Arslan, (2020),** who explained that there were significant differences in the "knowledge and believes obstacles and the obstacles in relationships with healthcare staff subscales" in relation to the education level and illiterate patients experienced more obstacles regarding the pervious subdimensions. In the same context **Tol, et al., (2012),** stated that the coping with DM was affected by the level of education of the patients which considered as one of diabetic obstacles. Also, **Akar et al. (2014),** was clarified that the level of the education and the perception of obstacles related to diabetes had inverse correlation.

Moreover, regarding monthly income there was a significant relation between monthly income and mean scores of DOQ, as well patients with insufficient income faced more obstacles in sub-dimensions of medication, knowledge, relationship with health care as well as total mean score. From the researchers' point of view low educational level and income among diabetic patients are important factors which affecting negatively on patients coping, self-monitoring and self-management of DM.

This finding is consistent with **Arslan, (2020)** who found that as income levels decreased, the patients encountered more

obstacles in the areas of self - monitoring and knowledge and beliefs subdimensions. Similar results to this study have been reported in the two studies by **Akar et al., (2014); Tol et al., (2012)** they reported that the low-income level of patients with diabetes leads to obstacles related to management and life style changed.

Regarding the obstacles faced by type 2 DM patients in relation to clinical data of the disease. Regarding smoking habit the present study stated that, the smoker patients faced more obstacles in medication subscales obstacles as well as total obstacles. This study results' in the line with **Özlem, et al., (2020),** who concluded that the importance of changing lifestyle behaviors such as smoking to promote disease coping and self-management efficacy. Thus, lifestyle behaviors should be evaluated when developing nursing interventions to decrease obstacles in coping with diabetes.

The current study revealed that type of treatment and presence of another chronic diseases beside DM had no significant relation with the total mean scores of DOQ, while follow up of DM, regular measurement of blood glucose level, practicing exercises, compliance with diabetic diet, presence of diabetes complications and duration of the disease had a highly significant relation with total mean scores of DOQ. These results may be related to the continuous and long effect of DM disease and lack of both knowledge and practices regarding all the previous variables can negatively have impact on diabetic patients and increase their obstacles. Therefore, the continuous educational programs that emphasized on good monitoring of blood glucose level, regular follow-up and life style changes can help diabetic patients to adapt with their disease.

This finding is in accordance with **Muz, et al., (2021)** who observed that the studied subjects who did not comply with their diabetic diet instructions and did not practice exercise regularly faced more obstacles in all DQQ sub-dimensions except for the obstacles related to the diagnosis sub-dimension. This result is congruent with **kahraman, et al., (2016)** who found that diabetic patients who did not monitor their blood glucose level regularly, did not follow their diabetic diet and did not

practice exercises had more obstacles with DM than other patients. This finding also is in agreement with **Byers et al., (2016)** who noticed that the studied subjects have many obstacles to follow nutritional, medication guidelines and life style changes. As well as the participants expressed a belief that the management of their disease was out of their control.

A similar result to the current study were obtained from **Onwudiwe, et al., (2014)** who reported that type 2 DM patients who didn't measure their blood glucose level regularly didn't adhere with their diet, and who didn't exercise regularly faced more obstacles and had more bad results in their disease management. Also, **Alshayban & Joseph (2020)** mentioned that majority of type 2 DM patients suffer obesity and low exercise practice hours which was a great obstacles face patient with type 2 DM to control their blood glucose levels. These results are in accordance with **Jones, et al., (2014)** who reported that one of the major obstacles faced by type 2 DM patients was adherence to prescribed diet, medication and diabetes follow up. As well **Abdulrahman, et al., (2020)** who mentioned that poor knowledge and awareness about type 2 DM leads to poor adherence to dietary regimen and medications which affects negatively on patients' quality of life. Therefore, it is thought that identifying the obstacles that patients with type 2 diabetes face, and helping them overcome those obstacles can facilitate the management of the disease and the treatment process. Support the process of adaptation and improve the individual's quality of life.

Conclusion

This study was concluded that, the type 2 DM is the most common among females than males, married, illiterate, widowed patients and housewives. As well more than one half of the study subjects were administered oral diabetic medications, with irregular diabetes follow up sessions. Regarding the obstacles faced by study subjects with type 2 DM. Additionally, this finding reveled that studied subjects had obstacles with medications, self-monitoring, knowledge & believe, diagnosis, life style and coping subdimensions. On the contrary, the studied

subjects didn't experience obstacles in receiving guidance and supporting and relationship.

When the obstacles faced by the patients with type 2 DM were examined according to their sociodemographic characteristics, it has been found significant relation between the total mean scores of the DOQ and level of education, occupational status, monthly income and persons living together. Regarding the obstacles faced by type 2 DM patients in relation to clinical data of the disease, it was noticed that type of treatment and presence of another chronic disease had no significant relation with the total score of diabetes obstacles questionnaire. While smoking habit, follow up of DM, measurement of blood glucose levels, practicing exercises, dietary compliance, diabetes complications and duration of disease had a significant relation with total scores of DOQ. Finally, after analysis of data and discussion, the research questions were answered.

Recommendations

Based on the study results, the current study recommended that:

- Expanding in the application of the educational programs for patients with DM which include health information and practical skills to cope with their disease and lifestyle changes.

- Duplication of the study in diverse location with a larger sample to provide generalization of the results of this study.

- Early detection of type 2 diabetes and active metabolic control in general practice can reduce coping obstacles faced by those patients, improve quality of life and reduce mortality.

- Further researches to examine the factors affecting coping in diabetic patients considering the individual variances and variables connected to the areas that patients perceive as obstacles.

- Further researches to examine the effect of such educational programs in reducing the obstacles in diabetic patients .

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