

Diabetes Distress among Patients with Type II Diabetes in Alexandria

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Abstract

*Diabetes mellitus is being increasingly recognized as a serious global health problem and is frequently associated with co-morbid distress contributing double burden for the individual and the society. **Objective:** Assess diabetes distress among patients with type II diabetes in Alexandria. **Setting:** The study was carried out at four health care settings rendering services in Alexandria namely: El Ramad Hospital Outpatient Diabetic Clinic, Bacus Family Health Center, Outpatient Diabetic Clinic in the Main University Hospital and Smouha Outpatient Diabetic Clinic. **Subjects:** Using the equal allocation method a random sample of 90 diabetic patients selected from each of the previously mentioned settings in Alexandria. The total sample size was 360 diabetic patients. **Tools:** Three tools were used for data collection: Patients' socio-demographic and clinical data structured interview schedule; The Diabetic Distress Scale-17 (DDS-17) and Summary of the Diabetes Self Care Activities Scale (SDSCA). **Results:** Findings of the present study revealed that less than half (45.6%) of the patients had high diabetes distress level. Nine variables were found to be predictors of high diabetes distress namely gender, age, residence place, level of education, work status, income sufficiency, disease duration, presence of complications and satisfaction with health services. **Conclusion:** Diabetes distress is a serious problem among diabetic patients with multiple related risk factors. **Recommendations:** Routine screening of diabetic patients for depression and diabetes-related distress, empower patients through interactive teaching strategies and involve them in the management of their diabetes.*

Keywords: Type II diabetes, diabetes distress, diabetic patients.

Introduction

Diabetes mellitus is one of the most common non communicable diseases globally. It is the fourth or fifth leading cause of death in most high income countries and there is substantial evidence that it is epidemic in many economically developing and newly industrialized countries⁽¹⁾.

Diabetes mellitus is undoubtedly a challenging health problem in the 21st century. Epidemiological evidences suggest that the incidence of diabetes is increasing worldwide. Globally, World Health Organization (WHO) estimated that 382 million people suffer from diabetes

with a prevalence of 8.3%. Additionally, the estimated number of diabetic patients in the world is expected to increase from 285 million in 2010 to 439 million in 2030 with a projected increase of 69% in numbers of adults with diabetes in developing countries and 20% in developed countries. Moreover, diabetes related deaths will increase by two thirds between 2010 and 2030. The international Diabetes Federation 2014, reported that 387 million people have diabetes and by 2035 this will rise to 592 million. In 2014, Diabetes caused 4.9 million deaths i.e. every seven seconds a person dies from diabetes⁽²⁻⁵⁾.

In Egypt, Diabetes is on a staggering rise. Data obtained from Egypt Demographic Health Survey (2008) shows that 6% of adults up to 59 years reported that they had diabetes. Recently, the International Diabetes Federation in 2014 estimated that there were over 7.5 million cases of diabetes with a prevalence rate reaching 15.4% among adult aged from 20 to 79 years^(6,7).

Type II is the most common form of diabetes mellitus comprising 90% of people with diabetes around the world. It is also called non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. Type II diabetes occurs more frequently in adults than in children its incidence increases with age, especially after age of 40 years^(1,2).

Diabetes is the most demanding chronic illness. It poses a big burden on individuals, families and societies^(1,8). It challenges every fiber of a patient's body and spirit and demands a system of care that ministers to the biological, social and psychological aspects of the illness⁽⁹⁾. Diabetes requires vigilant and sustained adherence to a complex and coordinated treatment regimen and daily management comprising multiple health behaviors to reduce patients' risk of serious complications such as heart disease and stroke, neuropathy and nephropathy^(1,8,10). There has been a growing focus on the involvement of patients in their management. Diabetes self-management is crucial to management of the disease and has been shown to mitigate future complications, reduce risk of comorbidities, and improve overall health^(11,12).

Self-management is an essential element of diabetes care and refers to the individual's ability to manage symptoms, treatment, physical and psychological consequences and lifestyle changes inherent to this chronic condition^(13,14). Diabetes management requires long-term adherence to diet, physical activity, medication, and

frequent monitoring of blood glucose levels, and patients have to learn to integrate self-management into their daily lives and to cope with complications. However, many patients experience emotional burdens in response to these prolonged requirements and sustaining daily diabetes regimen, including worry about complications, fear of hypoglycemia, feeling of guilt regarding uncontrolled blood glucose, and depressed mood. These negative emotional burdens associated with diabetes are defined as "diabetes-related emotional distress"^(8,12,13).

Diabetes-related distress is a part of diabetes and it is a non-psychiatric distress. It refers to the unique, often hidden emotional burdens and worries that are part of the spectrum of patient experience when managing a severe, demanding chronic disease like diabetes. It is a condition where patients are concerned with the management of their diseases, getting the support they need, managing the emotional burden of diabetes, as well as access to needed care⁽¹³⁾. It ranges from limited psychological problems to constant diabetes-related self-care behaviors such as regular blood sugar control, medications administration, insulin injection, and adherence to treatment regime⁽¹²⁻¹⁴⁾.

Diabetes-related distress poses additional constraints on patients and health care system. Many studies have revealed that it can significantly affect diabetic patients' health outcomes, especially their self-management^(1,14,15). High level of diabetes distress has been associated with poor glycemic control, poor quality of life, poor self-care and low diabetic self-efficacy^(14,15). Additionally, people with diabetes distress report more family conflict, have more contact with the health-care system, and have higher levels of both diabetes complications and death from any cause over time than their counterpart who do not have elevated levels of distress^(15,16).

Health care professionals must take necessary steps to better understand the nature of diabetes distress as care that does

not include recognition and understanding of these aspects of the disease leads to frustration, anger, disappointment, fatigue, disorganization, and burnout for both the clinician and the patient^(8,16,17). Unfortunately, the detection rate of diabetes distress, which is important for treatment, is still low. Researchers have identified many relevant factors that can trigger diabetes-related distress including the diagnosis, signs and symptoms of the diseases, complications, change in life style, cost of treatment and adherence to treatment regimen. Given the importance of a timely diagnosis and treatment of psychosocial distress, screening for diabetes-related distress in patients with diabetes should be integrated in structural diabetes care⁽¹⁸⁻²¹⁾.

Aims of the Study

The aim of the study is to assess diabetes distress among patients with type II diabetes in Alexandria.

Research Question:

What are types, level and risk factors of diabetes distress among patients with type II diabetes in Alexandria?

Materials and Method

Materials

Design: A descriptive design was adopted in this study.

Setting: The study was carried out at four health care settings rendered services for diabetic patients representing the three health sectors in Alexandria namely: El Ramad hospital outpatient diabetic clinic and Baccus family health center (affiliated to Ministry of Health and Population), Outpatient diabetic clinic in the Main University Hospital (affiliated to University Hospitals) and Smouha outpatient diabetic clinic (affiliated to Health Insurance Sector). These clinics were selected because they have the highest attendance rate.

Subjects:

- The sample size was estimate using Epi info 7 statistical program using the following parameters; prevalence of diabetes distress 26%, 95% confidence level with 5% maximum error. The minimum sample size estimated is 323 patients.
- Using the equal allocation method a random sample of 90 diabetic patients was selected from each of the previously mentioned settings. The total sample size was 360 diabetic patients.

Tools: In order to collect the necessary data for the study three tools were used:

Tool I: Diabetic patients' socio-demographic and clinical data structured interview schedule

It was developed by the researcher to collect the necessary data from diabetic patients. It included two parts:

First part: Patients' personal and socio-demographic data: It included the age, sex, level of education, occupation, income, living condition and marital status.

Second part: Patients' health status data: It included data about the disease duration, presence of diabetes complications and follow up.

Tool II: Diabetic Distress Scale -17 (DDS-17)⁽²²⁾

It is a brief self-reported scale to be used by diabetic patients. It was developed by Polonsky et al at 2005. DDS-17 is used to assess the diabetes related distress reflecting four distinct subscales; emotional burden (5 items), physician related distress (4 items), regimen related distress (5 items) and interpersonal distress (3 items). The responses to each item were rated on a 6 points frequency scale (1=not a problem, 2=a slight problem, 3=a moderate problem, 4=somewhat serious problem, 5=a serious problem and 6=a very serious problem). Considering a mean item score as a level of

distress worthy of clinical attention, cut off point was selected as little / no distress < 2, moderate distress 2- 2.9 and high distress \geq 3.

Tool III: Summary of the Diabetes Self Care Activities Scale (SDSCA)⁽²³⁾

It is a self-reporting instrument developed by Toobert et al at 2000 to measure the frequency of performing diabetes self-care tasks. It contains 12 items asked how often several activities such as diet (items 1, 2,3), exercise (items 4, 5), medication taking (item 6), blood sugar testing (items 7, 8), and foot care (items 9, 10, 11, 12) were carried out over a 7-day period. A score of less than three was considered as inadequate, while a score of more than three was considered as adequate (good self-care).

Method

- Approval from the responsible authorities was obtained through official letters from the Faculty of Nursing.
- Meetings were held with the directors of the selected settings to clarify the purpose of the study and to gain their cooperation and support during data collection.
- Tool (I) was developed by the researcher after reviewing the recent relevant literature. It was validated by juries of (5) experts in the field. Their suggestions and recommendations were taken into consideration.
- Cronbach Alpha Coefficient was used to ascertain the reliability of tool (II) and (III) after translation into Arabic language, ($r=0.86$ for tool II and 0.82 for tool III).
- Pilot study was carried out on 30 diabetic patients who were randomly chosen from outpatient diabetic clinic not included in the sample namely, "Ras El-Tin Hospital Outpatient Clinic" in order to ascertain the

relevance, clarity and applicability of the tools, test wording of the questions and estimate the time required for the interview. Based on the obtained results, the necessary modifications were done.

Ethical considerations:

- Informed oral consents were obtained from the patients after brief explanation of the purpose and nature of the research.
 - Anonymity and confidentiality of responses, voluntary participation and right to refuse to participate in the study were emphasized to patients. The researcher explained the objectives of the study to the participants.
- Data was collected by the researchers during the period from November 2014 to January 2015 (3 months).

Statistical Analysis

After data were collected, they were coded and transferred into specially designed formats so as to be suitable for computer feeding. Following data entry, checking and verification processes were carried out to avoid any errors during data entry, frequency analysis, cross tabulation and manual revision were all used to detect any errors. The statistical package for social sciences (SPSS version 16) was utilized for both data presentation and statistical analysis of the results. The level of significance selected for this study was P equal to or less than 0.05.

Results

Table (1) shows that less than two thirds (61.9%) of the patients were females while the rest (38.1%) were males. The age of the patients ranged from 40 to 70 years with a mean of 54.06 ± 9.54 . More than three quarters (77.8%) of the patients were

married while the rest were single, widowed or divorced. Furthermore, 80.6% of them were urban dwellers. Concerning the patients' educational level, the table shows that less than one quarter of the patients were illiterate or just could read and write (23.6%, 19.2% respectively), while those who completed their basic education, secondary or technical education constituted 20.8% and 25% respectively. On the other hand, only 11.4% of them had university education. The table also portrays that two thirds (60.6%) of the patients were not working and 36.7% of them had a monthly income less than 500 L.E. Moreover, the majority (91.7%) of them reported having an insufficient income.

Table (2) reveals that the duration of the disease among patients ranged from less than one year to 14 years with a mean duration of 9.12 ± 6.58 years. More than half (54.2%) of the patients have a disease duration less than 5 years and the rest reported either 5 to less than 10 years or 10 years or more (31.4% and 14.4% respectively).

Regarding the adequacy of diabetes self-care management behaviors, less than half of patients reported adequacy with diabetic diet and practicing exercises (43.3%, 34.7% respectively), while the majority (93.3%) stated compliance with drug therapy. On the other hand, compliance with foot care and blood sugar testing were reported by 65.6% and 55.8% of the patients respectively. The table also portrays that the vast majority (96.1%) of the patients were performing regular follow up. More than half (61.9%) of them had at least one follow up visit per month and only 11.7% of them paid three visits or more per month. Lastly, the table shows that less than half (48.1%) of the patients reported presence of diabetes related complications and less than one quarter (23.9%) of them were satisfied with the health services rendered by the diabetic clinic.

Table (3) presents the distribution of the patients according to the category, level and

mean scores of diabetes distress. The table reveals that high diabetes distress level was reported by 45.6% of the patients and moderate diabetes distress by 39.4%. Only 15% of the patients had no or low diabetes distress level. Regarding the emotional burden, the table shows that approximately half (49.4%) of the patients had high emotional burden level, while 30.3% and 20.3% of them had moderate or low level of emotional burden respectively. In relation to the physician distress, less than two thirds (63.3%) of the patients had high distress while 23.9% and 12.8% of them showed either moderate or low level of physician distress respectively. Concerning the regimen distress, the table shows that more than half (52.8%) of the patient had high diabetic regimen distress while the rest had either moderate or low regimen related distress (38.6%, 8.6% respectively). The table also shows that less than half (48.3%) of the patients had high degree of interpersonal distress, more than one third (36.1%) of them had moderate interpersonal distress level and 15.6% of them show no or low interpersonal related distress level.

Finally, the table reveals that diabetes distress total mean score was 2.31 ± 0.72 . Physician-related distress was the most common distress encountered among patients (2.51 ± 0.71), followed by regimen related distress (2.44 ± 0.65), interpersonal distress (2.32 ± 0.73) and emotional burden (2.29 ± 0.78).

Table (4) shows that diabetes distress was more prevalent among female patients (90.1%) than males (76.6%). A significant relation was observed between the patients' gender and diabetes distress ($P=0.000$). Regarding the patients' age, it is evident from the table that the lower the age the higher the diabetes distress since it was more encountered among patients aged forty to less than fifty (89%) followed by those aged fifty to less than sixty (83.6%) however it was least (81%) among those aged sixty years and more. Additionally the table reveals that a statistically significant

relation was found between the patient age and diabetes distress ($P=0.015$). Concerning patients' marital status, it is observed from the table that diabetes distress was higher (86.1%) among married patients than unmarried ones (81.3%). The marital status had a significant impact on patients' distress ($P = 0.052$). Furthermore, it was observed from the table that diabetes distress was much more encountered among rural residence (98.6%) than urban ones (81.7%). The place of residence had a significant impact on diabetes distress ($P = 0.002$). With respect to patients' education, diabetes distress was prevalent among all illiterate patients (100%) however; it was least among highly educated patients (78%). A statistically significant relation was observed between patients' educational level and diabetes distress ($P = 0.000$). The table also reveals that diabetes distress was more encountered among nonworking patients (86.7%) compared to working ones (82.4%). A significant relation was detected between diabetes distress and patients' working status ($P=0.043$). Lastly, the table illustrates that diabetes distress was higher among patients with monthly family income less than 500 L.E. (90.9%) and those reported income insufficiency (86.1%). Both patients' monthly income and its sufficiency had a significant impact on the occurrence of diabetes distress ($P=0.000$, $P=0.001$ respectively).

Table (5) shows the relation between the level of diabetes distress of diabetic patients and their disease experience and self-care management. The table portrays that, the shorter the duration of the diabetes, the higher the level of diabetes distress, since diabetes distress was more encountered among patients who had diabetes for less than 5 years (98.5%) compared to 73.1% of those who had diabetes for more than ten years. A statistically significant relation was found between the disease duration and diabetes distress ($P=0.000$). Concerning the adequacy of diabetes self-care management, it is observed from the table that diabetes distress was more prevalent among patients

who reported compliance with blood sugar testing (93.5%), followed by those patients who reported compliance with diet, medications and foot care (89.1%, 85.1%, 82.2% respectively). However, it was less encountered among patients who reported compliance with regular exercises (68.8%). A Statistically significant relation was observed between adequacy of diabetic self-management and diabetes distress ($P=0.054$). The same table also portrays that diabetes distress was higher (92.9%) among patients who paid no follow up visits and with the same percentage among those with three visits or more. The number of follow up visits had a significant impact on diabetes distress ($P=0.000$). Additionally, the table reveals that diabetes distress was more encountered among patients who reported no complications (91.4%). A statistically significant relation was found between the presence of complications and diabetes distress ($P=0.000$). Lastly, the table shows that distress was more prevalent among patients who reported dissatisfaction with health services (89.1%). A significant relation was found between the patients' satisfaction with the health services and diabetes distress ($P=0.000$).

Table (6) illustrates predictors of diabetes distress among the diabetic patients. The table reveals that nine variables were found to be predictors of high diabetes distress namely gender ($P=0.003$), age ($P=0.000$), residence place ($P=0.005$), level of education ($P=0.012$), work status ($P=0.003$), income sufficiency ($P=0.043$), disease duration ($P=0.000$), presence of complications ($P=0.051$), and satisfaction with health services ($P=0.053$).

Discussion

Diabetes mellitus is a metabolic disease with a rising prevalence worldwide. It is one of the most common endocrine disorders affecting almost 8.4% of the world's population⁽⁶⁾. Diabetes frequently coexists with mood problems as many people experience considerable distress

about having diabetes and the amount of hands-on management that it requires⁽⁵⁾. This often includes frustration with the ongoing obligations of diet, physical activity, blood glucose monitoring and taking medicines.

Diabetes-related distress refers to significant negative psychological reactions that are specific to one's diabetes diagnosis, potential or actual complications, self-management burdens, difficult patient-provider relationships, and problematic interpersonal relationships^(9,11).

It plays an important role in improving diabetes control and regime adherence and is linked to poor behavioural disease management. Identifying and assessing the modifiable determinants of diabetes distress plays a key role in making accurate and appropriate intervention planning programs and should be integrated into patients' self-care plan to achieve the best possible outcomes^(11,13). The aim of the study was to assess diabetes distress among patients with type II diabetic in Alexandria.

Diabetes is a common health problem that permanently changes the person's life either by the demanding set of lifelong self-care management or by its devastating complications which have an impact on a patient's quality of life⁽²⁴⁾. The patients may experience high levels of emotional stress stemming from concerns and worries associated with their diabetes and its management. Diabetes specific distress is a common condition that often includes high levels of negative affect⁽²⁵⁾. Results of the current study portrays that 39.4%, 45.6% of the patients had high and moderate distress respectively (table 3). These percentages were dramatically higher than those reported by Fisher et al. at 2009 who found a prevalence rate of 18% of distress among patients with Type 2 diabetes⁽¹³⁾. Additionally, the proportion of diabetes distress in the current study was much higher than those reported by Islam et al who found that 26.1% of the diabetic patients in their sample had moderate

distress and 22.4% had high distress⁽²⁶⁾. However, these results come in line with that of Mullanet al at 2007 who found a high prevalence of diabetes distress among T2DM in their longitudinal study for predicting diabetes distress over a period of 18 months as 48% of participants experienced high levels of diabetes distress⁽²⁷⁾. Similar results were provided by Baradaran et al at 2014 and Sakhar et al at 2013 who found that (35% and 40% respectively) of their diabetic patients suffered from diabetes distress^(28,29).

The greater burden of having diabetes and the amount of hands on management that diabetes requires, often includes frustration with the ongoing obligations of diet, physical activity, blood glucose monitoring, and taking medicines. This was reflected in the present study finding as 49.4% of the patients had high emotional burden and 52.8% of the patients had high regimen distress. In agreement, Islam et al 2013 reported that 56.4% of the diabetic patients in their sample experienced high diabetes related emotional burden, and 46.1% of them had high regimen distress⁽²⁶⁾. The present study also revealed that less than two thirds (63.3%) of the patients had high physician distress which may be attributed to lack of communication, effective interactions and trustful relation between patients and their health professionals, lack of the emotional support which is necessary to improve their quality of life and lack of empowerment strategies, information and directions on the proper way for managing their diabetes. The same findings were reported by Fisher et al at 2009 and Zhang et al at 2013^(13,30).

Regarding the diabetes distress mean scores, results of the current study revealed that diabetes distress total mean score among the patients was 2.31 ± 0.72 . The mean score for each domain such as physician-related distress, regimen related distress, interpersonal distress and emotional burden was (2.51 ± 0.71), (2.44 ± 0.65), (2.32 ± 0.73) and (2.29 ± 0.78)

respectively. These mean scores are in line with those reported by Tol et al at 2012⁽³¹⁾ on studying distress among Iranian diabetic patients since the total mean diabetes distress score was 2.96 ± 0.83 . The average score for each domain such as emotional burden, physician-related distress, regimen related distress and interpersonal distress was (2.40 ± 1.18) , (2.57 ± 0.88) , (2.97 ± 0.90) , (2.76 ± 0.91) respectively. Although, Shojaezadeh et al at 2012⁽³²⁾ reported approach average scores regarding total diabetes distress (2.17 ± 0.75) , lower average scores reported by them regarding domains such as physician-related distress and interpersonal distress (1.13 ± 0.32) , (1.40 ± 0.65) respectively).

It has been recognized that diabetes distress is a multi-factorial problem, considering these factors, tailoring a patient-centred, collaborative approach to match the fundamental realities of diabetes care becomes a necessity^(22,33,34). Findings drawn from the current study shed light on a set of patient-related variables that were significantly correlates with diabetes distress among patients.

Regarding the patients' sex, results of the present study revealed that distress was significantly higher among female patients than male ones (table 4). In agreement, Islam et al at 2013 and Baradaran et al at 2014 reported that diabetes distress was much higher in female patients^(26,28). These findings may be attributed to the fact that the majority of women as housewives spend most of their time at home; they have enough time to think about their diabetes, its complications and how to deal with it. Therefore, they would be overwhelmed and occupied with diabetes related thoughts.

Concerning the patients' age, evidence drawn from the current study significantly indicated that the lower the age of the patients, the higher the level of diabetes distress (table 4). Plausible explanation for such relation may be attributed to the additional stressors posed by managing diabetes on younger people having the life

stressors of family responsibilities, work and financial challenges. Moreover, they may cope less effectively with their restricting developmentally unexpected condition. Similar findings were reported by several researchers^(3,4,11,20,25,30).

These findings suggest that younger patients may require particular clinical attention to reduce distress and its negative impact on diabetes outcomes.

In line with the developmental-contextual model of couples coping with chronic illness which emphasizes the dyadic nature of disease management in the context of marriage⁽³⁵⁾, the results of the current study revealed that diabetes distress was much higher among married patients than unmarried ones (table 4). Moreover, the study showed significant association between diabetes distress and patients' marital status. The reason behind such significant link could be attributed to the strains and difficulties the married patients face for balancing their diabetes management activities with their family responsibilities and roles. Furthermore, it reflects the struggles they may experience in order to normalize their personal life and counteracting the limiting influence of diabetes on their marital life. These findings were supported by Sakhar et al at 2013 who reported higher diabetes distress level among married patients compared to unmarried ones^(29,35).

Regarding the place of residence, the present study revealed that diabetes distress was significantly higher among rural dwellers than urban ones (table 4). These findings could be attributed to the problems of rural areas like inadequate and unsatisfactory health services and the prevalence of illiteracy and poverty which in turn affect the patients' health. In contrast, Fisher et al at 2009⁽¹³⁾ found that diabetic patients from rural areas had less distress compared to residence of urban areas.

Considering the patients' education, the present work findings claimed that patients with lower level of education had higher rates of distress. This might be justified that lower level of education and limited literacy hindering patients from access to self-management related information. Along with the same findings, Schillinger et al at 2008 mentioned that the majority of patients presented with diabetes distress were illiterate⁽³⁶⁾.

It has been anticipated that, the limited financial resources will hinder any person from seeking medical help, getting the expensive treatment and costly diabetes management activities or performing follow up so they face their disease with a more pessimistic view which in return affects their physical and psychological status. This explanation was supported by the findings of the present study since diabetes distress was more encountered among non-working patients and those who reported income insufficiencies. Similarly, Polonsky et al at 2008 reported that the cost of diabetes management services was one of the main sources of stress for the diabetic patients⁽³⁷⁾.

Diabetes is a complex, chronic and costly disease. The quality of diabetes care is widely suboptimal, and most interventions for diabetes depend on active involvement and participation of patients by adhering to prescribed treatment. There has been a great weight of evidence indicated that people with diabetes distress report poorer management of their diet, physical activity, oral diabetes drug usage and blood glucose monitoring⁽³⁸⁻⁴²⁾. Conversely, evidence of the current study pointed out that diabetes distress was significantly higher among patients reported adequate self-management behavior regarding diet, medications and blood sugar testing (table 5). These findings could be explained by the patients' self-responsibility created by their cautious regarding the disease, worries about the complications combined by their

anxiety about inappropriate professional management and services since the majority (89.1%) of them reported dissatisfaction with services provided in the health settings.

Conclusion

Based upon the findings of the current study it could be concluded that distress is a significant health problem prevalent among adults with type 2 diabetes mellitus. Multidimensional risk factors were found to be predictors of high diabetes distress namely gender, age, residence place, level of education, work status, income sufficiency, disease duration, presence of complications and satisfaction with health services.

Recommendations

- Routine screening of patients with diabetes for depression and diabetes-related distress.
- Referral to appropriate social services, and psychosocial support; and involvement of mental health professions when needed.
- Empower patients through interactive teaching strategies, involving them in the management of their diabetes, proper communication counseling and self-efficacy, emotional and social support
- The care provided must be patient-centered, culturally sensitive, and appropriate for the patient's age, socioeconomic status, and ethnicity.
- Community resources may include accessible and convenient areas for exercise, affordable fresh food, and access to local pharmacists. In addition, telephonic and web-based interventions are showing promise as tools to reduce depression and anxiety among populations with diabetes.

Table (1): Distribution of diabetic patients according to their personal and socio demographic characteristics.

Item	n=360	
	No	%
Sex		
- Male	137	38.1
- Female	223	61.9
Age		
40- years	145	40.3
50- years	110	30.5
60+ years	105	29.2
X ± SD	54.06 ±9.54	
Marital status		
- Married	280	77.8
- Not married (single- widowed- divorced)	80	22.2
Residence place		
- Urban	290	80.6
- Rural	70	19.4
Educational level		
- Illiterate	85	23.6
- Read and write	69	19.2
- Completed basic education (primary + preparatory)	75	20.8
- Completed secondary/ technical education	90	25.0
- Completed university education or more	41	11.4
Work status		
- Working	142	39.4
- Not working	218	60.6
Monthly income		
- Less than 500 LE	132	36.7
- More than 500 LE	228	63.3
Income sufficiency		
- Yes	30	8.3
- No	330	91.7

Table (2): Distribution of diabetic patients according to the disease experience and management.

Item	n=360	
	No	%
Disease duration (in years)		
- ↓ 5	195	54.2
- 5 - 10	113	31.4
- 10 +	52	14.4
X ± SD	9.12 ± 6.58	
Adequacy of diabetes self-care management behavior#		
- Medication	336	93.3
- Foot care	236	65.6
- Blood sugar testing	201	55.8
- Nutrition	156	43.3
- Exercise	125	34.7
Number follow up visits / month		
- No visits	14	3.9
- One	223	61.9
- Two	81	22.5
- Three or more	42	11.7
Presence of complications		
- Yes	173	48.1
- No	187	51.9
Satisfaction with health services		
- Yes	86	23.9
- No	274	76.1

More than one answer is allowed

Table (3): Distribution of the patients according to diabetes distress type, level and mean score.

DDS domains	Level of diabetes distress						DDS Mean score X ± SD
	No/ Low		Moderate		High		
	No	%	No	%	No	%	
- Total DDS score	54	15	142	39.4	164	45.6	2.31±0.72
- Physician distress	46	12.8	86	23.9	228	63.3	2.51 ± 0.71
- Regimen distress	31	8.6	139	38.6	190	52.8	2.44 ± 0.65
- Interpersonal distress	56	15.6	130	36.1	174	48.3	2.32 ± 0.73
- Emotional burden	73	20.3	109	30.3	178	49.4	2.29±0.78

Table (4): The relation between the patients' diabetes distress and their socio demographic characteristics.

Item	Diabetes Distress Scores				Total	Test of Significance
	No Distress (N=54)		Distress (N= 306)			
	No	%	No	%		
Sex						
- Male	32	23.4	105	76.6	137	$X^2= 37.345$ P= 0.000**
- Female	22	9.9	201	90.1	223	
Age (in years)						
- 40-	16	11.0	129	89.0	145	$X_2^2= 13.212$ P= 0.015**
- 50-	18	16.4	92	83.6	110	
- 60+	20	19.0	85	81.0	105	
Marital status						
- Married	39	13.9	241	86.1	280	$X^2= 11.412$ P= 0.052**
- Not married	15	18.7	65	81.3	80	
Residence place						
- Urban	53	18.3	237	81.7	290	$X^2= 12.634$ P= 0.002**
- Rural	1	1.4	69	98.6	70	
Educational level						
- Illiterate	0	0.0	85	100	85	$X_4^2= 102.42$ P= 0.000**
- Read and write	12	17.4	57	82.6	69	
- Basic education	23	30.7	52	69.3	75	
- Secondary/technical education	10	11.1	80	88.9	90	
- University education	9	22.0	32	78.0	41	
Work status						
- Working	25	17.6	117	82.4	142	$X^2= 1.651$ P= 0.043**
- Not working	29	13.3	189	86.7	218	
Monthly income						
- Less than 500 LE	12	9.1	120	90.9	132	$X^2= 34.829$ P= 0.000**
- More than 500 LE	42	18.4	186	81.6	228	
Income sufficiency						
- Yes	8	26.7	22	73.3	30	$X^2= 13.934$ P= 0.001**
- No	46	13.9	284	86.1	330	

** Significant at $P \leq 0.05$

Table (5): The relation between the patients' diabetes distress and their disease experience and management.

Item	Diabetes Distress				Total	Test of Significance
	No Distress (N=54)		Distress (N= 306)			
	No	%	No	%		
Disease duration (in years)						
- ↓5	3	1.5	192	98.5	195	$X_2^2=121.385$ P= 0.000**
- 5- 10	37	32.7	76	67.3	113	
- 10 +	14	26.9	38	73.1	52	
Compliance with diabetes self-management activities						
- Diet	17	10.9	139	89.1	156	$X^2= 7.452$ P= 0.054**
- Exercise	39	31.2	86	68.8	125	
- Medication	50	14.9	286	85.1	336	
- Foot care	42	17.8	194	82.2	236	
- Blood sugar testing	13	6.5	188	93.5	201	
Number follow up visits / month						
- No visit	1	7.1	13	92.9	14	$X_2^2= 113.56$ P= 0.000**
- One	43	19.3	180	80.7	223	
- Two	7	8.6	74	91.4	81	
- Three or more	3	7.1	39	92.9	42	
Presence of complications						
- Yes	38	22.0	135	78.0	173	$X^2= 15.519$ P= 0.000**
- No	16	8.6	171	91.4	187	
Satisfaction with health services						
- Yes	24	27.9	62	72.1	86	$X^2= 112.401$ P= 0.000**
- No	30	10.9	244	89.1	274	

** Significant at P≤0.05

Table (6): Predictors of diabetes distress among the study subjects using binary logistic regression analysis (Enter method).

Characteristics	B	S.E.	Wald	P
Sex (male/ female)	.747	.636	1.381	.003*
Age (less than 50 years/ more than 50 years)	1.735	.148	138.106	.000*
Marital status (married / not married)	.933	.664	1.972	.160
Residence place (urban/ rural)	3.011	1.060	8.064	.005*
Level of education (university education / less education)	-2.232	.884	6.382	.012*
Work status (working/ not working)	1.789	.601	8.846	.003*
Monthly Income (less than 500 LE/ more than 500 LE)	-.519	.383	1.839	.175
Income sufficiency (enough /not enough)	1.373	.679	4.096	.043*
Disease duration (less than 5 years/ more than 5 years)	-3.673	.903	16.546	.000*
Regularity of follow up (regular/ irregular)	14.712	779.839	.000	.998
Number of follow up visit/ month (once/ more)	18.431	816.941	.000	.995
Therapeutic plan compliance (yes/ no)	-.137	.520	.069	.792
Complications (yes/ no)	.760	.389	3.819	.051*
Satisfaction with health services (yes/ no)	.344	3.758	-.668	.053*
Constant	-11.012	935.462	138.106	.0001

Model X2 = 231.641, P < 0.0001 Cox & Snell R2=.183 *Significant at P = 0.05

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