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Social Stressors and Quality of Life in Patients with Type II Diabetes Mellitus Visiting a Tertiary Care Hospital by Using Quality of life Enjoyment and Satisfaction Questionnaire–Short Form

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ABSTRACT

Objective: Quality of life is affected by the social stressors along with diabetes. The objective of our study was to assess different aspects of social stressors amongst the patients with type II diabetes mellitus versus non- diabetic's people by using the quality-of-life enjoyment and satisfaction questionnaire (Q-LES-Q-SF).

Methodology: This case control study was piloted at Ziauddin University Hospital, Clifton Campus, South, Karachi, by using consecutive sampling technique. The period of the study was one year after the approval of synopsis. Ethical approval was permitted by the Ethical Review Committee of Ziauddin University Hospital. A total of 272 patients were divided equally into two groups were selected for this study, and their ages were ranging from 25 to 60 years. 136 patients were in the case study group who had Type II diabetes, whereas 136 patients were in the control group who were healthy. To measure depression, the Q-LES-Q-SF Scale was used to record depressing symptoms. SPSS version 21 was used for the analysis of data. Chi-square test and t test was used for the significance

Results: It showed that a significant difference ($p<0.001$) was observed between mean age of the diabetics and non-diabetics. Significant difference ($p=0.018$) was observed between mean age duration of illness of the diabetics and non-diabetics. Significant difference ($p=0.014$) was observed in diabetes and non-diabetes with respect to social rating. Hypertension was observed with the significant difference ($p<0.001$). Diabetes was reported with the significant difference ($p<0.001$).

Conclusion: This study concluded that most of the diabetic patients had a significant impact with respect to their quality of life which was based on social assessment, health care expenses, economic position, HbA1c level and comorbids because of that they showed depressing symptoms that were more common in diabetic patients as compared to non-diabetic individuals.

Key words: Social stress, Type II diabetes, Quality of life enjoyment and satisfaction questionnaire

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INTRODUCTION

Prolonged diseases and associated consequences may cause psychological concerns as these diseases effect on both mental health and standard of living [1]. It is well-known that despite uncontrolled causes and the mechanism of diseases; different chronic diseases related to age may stimulate comparable psychosomatic unreasonable aspects, which can even envisage severity of illness and death autonomously of a broad diversity of prospective confounders [2,3].

Numerous studies have been reported that both anxiety and depression are signs of chronic diseases and associated effects. Mental and psychological traits may also define the behavior of people [4-6]. One of the most challenging diseases to cope with, owing to several different associated concerns is diabetes mellitus (DM).

Contrarily Type-1 and Type-2 Diabetes Mellitus are also known as mature diabetes, which has affected for over 90% of cases and is considered as a high level of blood glucose as a result of the failure of a body to properly metabolize and digest the glucose for the needs of a body, regarding resistance of insulin and insulin related insufficiency [7]. T2DM is an epidemic metabolic illness along with morbidity and mortality, which is being expected to affect as a minimum of 285 million people internationally, and more expected to have affect 438 million people by the end of year 2030 [8].

In Pakistan, the occurrence of T2DM, the urban people were more prone to it over 25 years of age, in which about6.8% were males and 5.1% were females, where as it was found low in rural populace i.e., about 5% were males and 4.8% were females [9].

Those patients suffering from T2DM and depression both have found multiple health problems for example insufficient self-care and inadequate control of diabetes. Investigators have stated that about 1 in 3 patients of T2DM in conjunction with depression have lessened physical capability and reduced quality of life [10].

Depression can have a variety in nature i.e., from psychosomatic to severe physical discomfort that may possibly be a consequence of neuropathy of diabetes, ophthalmological complications as a result of retinopathy of diabetes, sexual problems, economical load to the hospital due to repeated visits to clinics or admission to the hospitals [11]. In T2DM patients, the probable risk factors for anxiety and depression are younger age, women, traditional elements, low sociolinguistics and socio-economic position, bad experiences of life and conditions of prolonged stress [12,13].

T2DM patients can influence a person already prone to depression and stress, decreasing quality of life with respect to keeping good health [14]. The happening of depression's fear and distress amongst the patients already suffering from T2DM affects not only a his/her practical and economic status but also a mental burden along with his/her family life, which leads to poor control of glucose level, non-fulfillment of medication, and deteriorating following diet, physical exercise, and carelessness with him/herself [15,16].

Some study revealed that the patients of T2DM generally exhibit rise in their entire cholesterol in addition to Low Density Lipoprotein (LDL) along with hypertension (HTN), myocardial infarction and chances of stroke [17]. A study also reported that the women with T2DMpossessleadingsymptoms of depression as risk factors alone for increasing an accelerated rate of heart illnesses [18]. Likewise, one more research reported that in T2DM, depression was expected to have been heart illnesses amongst 60 years of age and above just because of the systolic hypertension [19].

A feature of quality of life is considered as opinion that integrates particular physical perception, emotional, social, and mental health which comprises of both the perceptive constituents such as satisfaction and emotional elements such as pleasure and happiness of an individual [20].

Physical health commonly viewed as the ability to work freely in activity connected to personal wishes. Psychosomatic reasons of quality of life are interrelated to mental and emotional health status, various conditions of stress, anxiety, depression, and pleasure of daily life, self-assessment of positive and negative sentiments [21,22].

Therefore, the present study focused on the evaluation of various factors of social stressors in those individuals suffering fromT2DM than non-diabetics by using the quality-of-life enjoyment and satisfaction form (Q-LES-Q-SF).

METHODOLOGY

This was the case-control study organized in Ziauddin University Hospital, Clifton Campus, South, Karachi, by using consecutive sampling technique. The duration of the study was 6 months started from January2020 till May 2020.

A total of 272 subjects were taken for the study who were then distributed into two groups, wherein 136 patients were in each group with diabetes and the remaining 136patients were kept in the control group and their ages were ranging from 25 to 60 years. Ethical approval was permitted by the Ethical Review Committee of Ziauddin University Hospital.

The patients who were diagnosed T2DM with documentary evidence of HbA1c (>6.5) or 2 reports of RBS (>200mg/dl), and the patients who were on treatment for at least 6-months, and on oral hypoglycaemic or insulin therapy were included as the case study, while healthy individuals were comprised of as the control group.

However, patients who were on psychotropic medications i.e., anti-psychotics and anti-depressants, and had neurodegenerative illnesses especially multi-infarct dementia, Alzheimer disease, etc., which could affect with mental assessment, subjects with malignancy on chemotherapy, those patients were on drugs (cannabinoids or opioids) and alcohol addiction and had thyroid associated problems (diagnosed hypothyroidism & hyperthyroidism); were all excluded from the study.

History was taken from every single subject for co-morbid like Hypertension, Asthma, Hepatitis B or C, Epilepsy and Ischemic Heart Disease, Diabetes and its complications. To measure depression Q-LES-Q-SF Scale was used to record depressive symptoms.

It was a self-reported quality of life measurement which consisted of 16 items that assesses satisfaction of

patient's physical fitness, social relations and ability to work in everyday life, physical movement, relation with family, temperament, libido and awareness, skill to perform work, hobbies, leisure ours activity, and domestic schedules, socio-economic status, standard of living, cognitive therapy and general health. Every item used5-point scale that ranged from 1 (very poor) to 5 (very good).

The frequency was calculated for descriptive figures like age, gender, marital status, income, period of illness, number of co-morbid circumstances, scores of depression, mean duration of treatment, and complications connected to Diabetes Mellitus. The quality of life (Q-LES-Q-SF) was used as dependent variable.

Data were analyzed using SPSS version 21. Chi-square and t test was applied to assess the association. P value was considered $p<0.05$ as statistically significance level.

RESULTS

Mean age of the group with diabetes was 55.13 ± 9.10 years, and with non-diabetic group; it was 43.25 ± 12.97 years with a substantial difference between the groups ($p<0.001$). In Diabetic group, mean duration of illness was 8.51 ± 7.57 years and with non-diabetic group, it was 6.73 ± 4.42 years with the significant difference ($p=0.018$). Mean HbA1c in the diabetic group was 6.91 ± 1.40, and with non-diabetic group; it was 5.78 ± 0.87 with a significant difference between the groups ($p<0.001$). Mean health care expenditures in the diabetic group were Rs. 7,180.88 ± 5,356.20/year and in the non-diabetic group; it was Rs. 5,888.23 ± 4,286.18/year with a significant difference ($p=0.029$). A significant difference ($p=0.014$) was also observed in diabetes and non-diabetes with respect to social rating.(Table 1). An insignificant difference ($p=0.088$) was observed with respect to frequency of gender in diabetics and non-diabetics. As far as highest education is concerned, 81(59.0%) cases were reported as non-diabetic and 47(34.6%) were diabetic patients that were studying in university while 38(27.9%) cases were observed diabetic and 29(21.3%) were non-diabetic studying in intermediate with the significant difference ($p=0.002$). Marital status was not reported as statistically significant between diabetics and non-diabetics (Table 2). Hypertension was observed in diabetic 91(66.9%) and non-diabetic 91(66.9%) with the significant difference ($p<0.001$). Asthma was also reported in diabetic group 10(7.4%) with the significant difference ($p=0.047$). Diabetes was reported in 17(12.5%) cases with the significant difference ($p<0.001$). Complications associated with the diabetes such as diabetic nephropathy in 24(17.6%), Diabetic neuropathy in 26(19.1%), Diabetic retinopathy in 12(8.8%) cases was observed with the significant difference ($p<0.001$). Prescribed medicines were taken in 129(94.9%) cases in diabetic while 76(55.9%) cases in non-diabetic with the significant difference ($p<0.001$). 87(64.0%) cases taking pills daily in diabetic group whereas 45(33.1%) cases in non-diabetic group with the significant difference ($p<0.001$) (Table 2).

Economic status has an influence on diabetes therefore, 52(38.2%) cases with diabetes were considered as good and 37(27.2%) cases were considered as very good on the "Quality of Life Enjoyment and Satisfaction Questionnaire", while 72(52.9%) cases were considered as good and 20(14.7%) were as very good with non-diabetes with the significant difference ($p=0.036$). On the other hand, other items on Q-LES-Q-SF in diabetic and non-diabetic groups were not reported as statistically significant (Table 3).

Table 1: Baseline demographics of diabetic versus non-diabetic group (continued).

Variables		Diabetic	Non-Diabetic	P-value
		Mean SD/n%	Mean ± SD/n%	
Age		55.13 ± 9.10	43.25 ± 12.97	<0.001
Duration of Illness in Years		8.51 ± 7.57	6.73 ± 4.42	0.018
HbA1c		6.91 ± 1.40	5.78 ± 0.87	<0.001
Health Care Expenditure		7180.88 ± 5356.20	5888.23 ± 4286.18	0.029
Social Rating		164.0 ± 155.60	124.75 ± 99.02	0.014
Total Score		10.44 ± 7.87	8.77 ± 7.11	0.069
Gender	Male	55(40.4%)	69(50.7%)	0.088
	Female	81(59.6%)	67(49.3%)	
Based in the	OPD	125(91.9%)	114(83.8%)	0.099
	Ward	11(8.1%)	22(16.2%)	
Highest Education	None	16(11.8%)	7(5.1%)	0.002
	Matric	29(21.3%)	13(9.6%)	
	Intermediate	38(27.9%)	29(21.3%)	

	Bachelors	3(2.2%)	1(0.7%)	
	University	47(34.6%)	81(59.0%)	
	B.E Mechanical	1(0.7%)	0(0.0%)	
	B.Sc	2(1.5%)	1(0.7%)	
	B.Com	0(0.0%)	1(0.7%)	
	B.A	0(0.0%)	1(0.7%)	
	Medical field	0(0.0%)	2(1.5%)	
Marital Status	Single	6(4.4%)	25(18.4%)	>0.999
	Separated	4(2.9%)	3(2.2%)	
	Widowed	19(14.0%)	8(5.9%)	
	Married	106(77.9%)	97(71.3%)	
	Divorced	1(0.7%)	3(2.2%)	

Table 2: History of various diseases of diabetic versus non-diabetic group.

Variables		Diabetic	Non-Diabetic	P-value
Hypertensions	Yes	91(66.9%)	46(33.8%)	<0.001
	No	45(33.1%)	90(66.2)	
Asthma	Yes	10(7.4%)	3(2.2%)	0.047
	No	126(92.6%)	133(97.8%)	
Epilepsy	Yes	0(0.0%)	1(0.7%)	0.316
	No	136(100.0%)	135(99.3%)	
Hepatitis B/C	Yes	7(5.1%)	3(2.2%)	0.197
	No	129(94.9%)	133(97.8%)	
IHD	Yes	4(2.9%)	2(1.5%)	0.409
	No	132(97.1%)	134(98.5%)	
Diabetes	Yes	17(12.5%)	0(0.0%)	<0.001
	No	119(87.5%)	136(100.0%)	
Any Complication	Diabetic nephropathy	24(17.6%)	4(2.9%)	<0.001
	Diabetic neuropathy	26(19.1%)	2(1.5%)	
	Diabetic retinopathy	12(8.8%)	3(2.2%)	
	Diabetic	14(10.3%)	4(2.9%)	
	No	60(44.1%)	123(90.4%)	
Taking Pills	Daily	87(64.0%)	45(33.1%)	<0.001
	Insulin	36(26.5%)	13(9.6%)	
	No	13(9.6%)	78(57.4%)	
Take Prescribed Medicines	Yes	129(94.9%)	76(55.9%)	<0.001
	No	7(5.1%)	60(44.1%)	
Financial Difficulties	Yes	22(16.2%)	34(25.0%)	0.072
	No	114(83.8%)	102(75.0%)	
Family History	Yes	38(27.9%)	24(17.6%)	0.088
	No	94(69.1%)	111(81.6%)	

Father	1(0.7%)	0(0.0%)
Mother	2(1.5%)	0(0.0%)
Brother	1(0.7%)	0(0.0%)
Wife	0(0.0%)	1(0.7%)

Table 3: Quality of life enjoyment and satisfaction questionnaire–short form (Q-LES-Q-SF) between diabetic and non-diabetic groups.

Variable		Very Poor	Poor	Fair	Good	Very Good	P-value
.....Physical health?	Diabetic	0(0.0%)	14(10.3%)	45(33.1%)	54(39.7%)	23(16.9%)	0.487
	Non-diabetic	0(0.0%)	12(8.8%)	47(34.6%)	62(45.6%)	15(11.0%)	
.....mood?	Diabetic	4(2.9%)	8(5.9%)	43(31.6%)	55(40.4%)	26(19.1%)	0.174
	Non-diabetic	1(0.7%)	13(9.6%)	48(35.3%)	59(43.4%)	15(11.0%)	
.....work?	Diabetic	1(0.7%)	10(7.4%)	36(26.5%)	64(47.1%)	25(18.4%)	0.439
	Non-diabetic	0(0.0%)	9(6.6%)	49(36.0%)	56(41.2%)	22(16.2%)	
.....household activities?	Diabetic	0(0.0%)	13(9.6%)	33(24.3%)	63(46.3%)	27(19.9%)	0.197
	Non-diabetic	1(0.7%)	13(9.6%)	49(36.0%)	53(39.0%)	20(14.7%)	
.....social relationships?	Diabetic	3(2.2%)	12(8.8%)	33(24.3%)	57(41.9%)	31(22.8%)	0.664
	Non-diabetic	3(2.2%)	13(9.6%)	43(31.6%)	53(39.0%)	24(17.6%)	
.....family relationships?	Diabetic	0(0.0%)	8(5.9%)	35(25.7%)	48(35.3%)	45(33.1%)	0.264
	Non-diabetic	3(2.2%)	12(8.8%)	40(29.4%)	45(33.1%)	36(26.5%)	
.....leisure time activities?	Diabetic	2(1.5%)	14(10.3%)	42(30.9%)	57(41.9%)	21(15.4%)	0.155
	Non-diabetic	3(2.2%)	29(21.3%)	38(27.9%)	49(36.0%	17(12.5%)	
.....ability to function in daily life?	Diabetic	1(0.7%)	13(9.6%)	39(28.7%)	49(36.0%)	34(25.0%)	0.772
	Non-diabetic	2(1.5%)	16(11.8%)	41(30.1%)	51(37.5%)	26(19.1%)	
.....sexual drive, interest and/or performance?	Diabetic	10(7.4%)	10(7.4%)	41(30.1%)	58(42.6%)	17(12.5%)	0.221
	Non-diabetic	6(4.4%)	20(14.7%)	34(25.0%)	63(46.3%)	13(9.6%)	
.....economic status?	Diabetic	1(0.7%)	10(7.4%)	36(26.5%)	52(38.2%)	37(27.2%)	0.036
	Non-diabetic	2(1.5%)	5(3.7%)	37(27.2%)	72(52.9%)	20(14.7%)	
.....living/housing situation?	Diabetic	0(0.0%)	11(8.1%)	30(22.1%)	49(36.0%)	46(33.8%)	0.099
	Non-diabetic	0(0.0%)	11(8.1%)	35(25.7%)	62(45.6%)	28(20.6%)	
.....ability to get around physically without feeling dizzy or unsteady?	Diabetic	0(0.0%)	11(8.1%)	45(33.1%)	52(38.2%)	28(20.6%)	0.709
	Non-diabetic	1(0.7%)	7(5.1%)	44(32.4%)	57(41.9%)	27(19.9%)	
.....your vision in terms of ability to do work or hobbies?	Diabetic	0(0.0%)	9(6.6%)	42(30.9%)	59(43.4%)	26(19.1%)	0.721
	Non-diabetic	0(0.0%)	12(8.8%)	48(35.3%)	53(39.0%)	23(16.9%)	
.....overall sense of well being?	Diabetic	0(0.0%)	14(10.3%)	41(30.1%)	56(41.2%)	25(18.4%)	0.574
	Non-diabetic	1(0.7%)	12(8.8%)	38(27.9%)	66(48.5%)	19(14.0%)	
.....medication? (If not taking any, check here ____ and leave item blank.)?	Diabetic	2(1.5%)	7(5.1%)	40(29.4%)	61(44.9%)	26(19.1%)	0.54
	Non-diabetic	3(2.2%)	13(9.6%)	41(30.1%)	60(44.1%)	19(14.0%)	
.....How would you rate your overall	Diabetic	0(0.0%)	4(2.9%)	51(37.5%)	52(38.2%)	29(21.3%)	0.103
life satisfaction and contentment?	Non-diabetic	2(1.5%)	12(8.8%)	49(36.0%)	53(39.0%)	20(14.7%)	

DISCUSSION

In relation to our current study results, symptoms of depression and anxiety were witnessed higher amongst diabetics than non-diabetics. Similarly, in the investigation of some other studies concerning anxiety and depression, a higher incidence has been revealed amongst those people suffering from diabetes than controls, which is consistent with our study results [23-25]. Although, the relationship between anxiety and depression with those of diabetics; has been indicating since long, however, the symptoms for rate of recurrence is speedily increasing globally [26-28]. Consequently, it is imperative to know the existence of such symptoms among the people having diabetes, specifically to improve the treatment compliance, which ultimately effects on diabetic control positively [29]. One more study lead to describe the incidence of anxiety and depression amongst 820 patients who were prone to type II diabetes mellitus, by using the Hamilton Depression Rating Scale (HDRS) and revealed that in the study 48.27% and 55.1% diabetic patients were having depression and anxiety, respectively. It was observed that the leading cause of anxiety and depression was the profession and difficulties in diabetes, whereas glucose levels in diabetes were interconnected with depression. Therefore, it is stated that diabetic complications had highly significant cause for both anxiety and depression [30].

As far as our study is concerned, frequency of anxiety and depression withT2DMuponusing the Quality of Life Enjoyment and Satisfaction Questionnaire Scale, discovered that there were 81(59.6%) females and 55(40.4%) males with diabetes mellitus type II were having from anxiety and depression, whereas69(50.7%) were males and 67(49.3%) were females with non-diabetes were suffering from depression with the significant difference (p=0.008), therefore, it is proved that males had a better quality of life than females.

Other study showed that men were spending better quality of life than women, comparatively, with statistically significant difference in the area of liveliness and pain. Healthier social life and physical movement might give higher levels of satisfaction to men [31]. In the lights of our study, males had better control on diabetes than females therefore, enjoyed a better quality of life.

One more study revealed that the patient's age ranging from 8-17 years presented low stress and improved quality of life, and this is just because of that the patients in young age are more relaxed, hopeful and have a positive view point on life.

It has also determined that the patients suffering from diabetes enjoy similar quality of life in their young age than older patients [32]. As far as our study is concerned, mean age of diabetic patients was55.13 ± 9.10 years and4 3.25 ± 12.97 years was for non-diabetics with a significant difference (p<0.001), diabetic patients were older than non-diabetics so they did not enjoy better quality of life as compared to non-diabetic.

The findings of Nejhad et al. indicated statistically significant influence of education level on the stress level and the quality of life of patients suffering from diabetes. This study was consistent with some more studies and has confirmed the direct association between the education level and a quality of life [33]. Our study reported a significant difference (p=0.002) which is between the level of education and the level of stress and quality of life with the patients suffering from diabetes.

The outcomes of another study also discovered a significant relationship statistically between the economic/financial condition as well as stress level and the quality of life, therefore it can be said that the lower the economic/financial condition, the higher the stress level and lower the quality of life. Diabetic patients are more reliant on economic/financial state of affairs due to the social system they follow in the society when consuming healthy diets. To adopt this system good economic/financial conditions are indispensable, therefore, it revealed that patients in poor economic situation showed high stress and low quality of life [31].

Our study findings were consistent with the above mentioned study where economic status affects the quality of life and create more stress on diabetic patients. Frequency of anxiety and depression with T2DM,upon using the Quality of Life Enjoyment and Satisfaction Questionnaire, discovered that lower economic status increased the stress level and lowered the quality of life with a significant difference (p=0.036).

Another study reported that the duration of any illnesses is one of the reasons that work as an important part in the anxiety/stress and satisfaction of life in diabetic patients. In our study the outcomes exhibited statistically significant positive relationship between the stress level and the period of ailment, which concludes that the longer the disease persists more stressed and lower the quality of life [34].

Our study was also shown the significant difference (p=0.018) between the duration of illness and degree of stress in diabetic patients. Further, the duration of diabetes is related to the progression of stress/ depression. Larger duration of illness is known to have significantly elevated the risk for emerging diabetic problems and health related costs. Consequently, such types of patients are more inclined to grow psychological/mental disorders and lower the quality of life.

One more study reported that the rising frequency of incidence of depression/stress with comorbidities in patients shows the negative impact on the depression with co-morbidity and the quality of life which can considerably affect the consequences of the disease as well as timely diagnosis of anxiety / depression can improve the quality of life [35]. Our study showed that

high prevalence of hypertension with significant difference (p<0.001), asthma (p=0.047) and complications associated with diabetes (p=<0.001) can significantly affects the outcome of the disease and decreases the quality of life, which can improve with early diagnosis.

CONCLUSION

It was concluded that most of the diabetic patients showed a significant effect on their quality of life which is based on socio-economic status and health care costs due to which they experienced symptoms of depression, anxiety, and stress more regularly than non-diabetics. Moreover, in our study results, co-morbidities like hypertension, asthma, complications connected with the diabetes were significantly higher amongst diabetics than non-diabetics.

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