



Original Article

Diabetes Mellitus and its impact on Quality of life

Shomaila Irim^{1*}, Khurram Munir², Asma Hussain³, Saima Mir⁴, Moazzma Ahmed⁵, Jais Kumar Karmani⁶, Amanullah Nazir⁷, Iqra Naz⁸ and Faisal Basheer⁹

¹GC University Faisalabad, Faisalabad, Pakistan

²Sheikh Zayed Medical College, Rahim yar Khan, Pakistan

³Independent Medical College Faisalabad, Faisalabad, Pakistan

⁴DHQ Teaching Hospital, Rawalpindi

⁵Benazir Bhutto Hospital, Rawalpindi Medical university, Pakistan

⁶Islamabad Medical and Dental College, Islamabad, Pakistan

⁷Riphah International University Islamabad, Pakistan

⁸Ibadat International University Islamabad, Pakistan

⁹Rehabilitation Department PPTA, Pakistan

ARTICLE INFO

Key Words:

Diabetes Mellitus, Patients, Insulin, Depression, Life Style

How to Cite:

Irim, S., Munir, K., Hussain, A., Mir, S., Ahmed, M., Karmani, J. K., Nazir, A., Naz, I., & Basheer, F. (2022). Diabetes Mellitus and its impact on Quality of life: Diabetes Mellitus and its impact on Quality of life. Pakistan BioMedical Journal, 5(5).
https://doi.org/10.54393/pbmj.v5i5.404

*Corresponding Author:

Shomaila Irim

GC University Faisalabad, Faisalabad, Pakistan

Received Date: 26th April, 2022

Acceptance Date: 27th May, 2022

Published Date: 31st May, 2022

ABSTRACT

Objective: To narrate the characteristic of life of patients having type II Diabetes mellitus (DM2) & the factors influencing it. **Methods:** This was a cross-sectional study. Patients with diabetes mellitus type 2 (DM2) who were over the age of 18 were chosen. Age, gender, profession, matrimonial status, time of type two diabetes development, other diseases, depressive status were all evaluated as factors that affect quality of life (Beck Depression Inventory). A (HRQOL) scale was utilised to assess the quality of life by using the thirty-six-item short-form survey (SF-36). Based on their SF-36 patients were separated into three groups. **Results:** One thousand three hundred and ninety four sample had a middle phase of 62 years. An average score of 50.1 was assigned to the global HRQOL. According to bivariate analysis, phase, matrimonial status, gender, employment, comorbidities, DM2 duration, and other diseases all had an effect on HRQOL. In the regression model (logistic), age (OR 1.04) and depression (OR 4.4) were identified as independent factors that influenced overall quality of life. **Conclusion:** The HRQoL of DM2 patients is lower, which is associated to a higher risk of depression. The presence of depression and advanced age have a negative impact on the patient's HRQoL.

INTRODUCTION

Type 2 diabetes mellitus (DM2) is a well-known disease that cause tenacious hyperglycemia because of two conditions. It can be due to no generation of insulin or may be the body is getting resistant to use insulin efficiently [1,2]. Over weight leads to insulin resistance in peripheries which can be reason of developing DM2 progressively [3]. According to National Institute of Health survey, the incidence rate of Obesity in Mexico has been raised intensely since 2000, from 61.8% to 71.3%. [4, 5]. So consequently, from 2000 to

2012, the frequency of DM2 increased from 5.7% to 9.1% in people above age of 20 years [6]. More medical centers and treatment sessions needed due to more problems and complications, such as vascular problems which include hypertension. Acute Myocardial infarction, deep venous thrombosis, cerebrovascular disorder and heart failure [7]. CVA and AMI presented to be 2-4 x more in patients with DM2 [8]. Complications of vascular disease like retinopathy, neuropathy and nephropathy [9], Diabetic foot

syndrome as well [10]. These problems lead patients to depression and stress. DM can trigger mood swings and hurt the self-esteem, make others frustrated [11, 12]. Life style has been highlighted as chief health care factor in these years. The aim of medical should be to recover health of patient [13]. Hence, it impacts not only the quantity but also QOL as well. This term QOL comprise the mentally, physically, social and spiritually well-being of a person. [14]. Stress due to diabetes, medication adherence, prolong duration, use of insulin, and comorbidities are including in QOL because of their impact on people with DM2 [15-19]. To make the diabetes treatment effective, there should be emotional coherence between family and patient. And blood glucose level in blood must be regulated. [20]. In few developing countries where sociocultural factors can affect quality of life and significant no of contributors and features connected to QOL can be measured, in spite of the fact that there have been various researches conducted on QOL on diabetic patients.

METHODS

Patients were selected from five Institutes of twin cities hospitals situated in Rawalpindi or Islamabad. [21]. All consecutive outpatients over the age of 18 years who were diagnosed with DM2 according to the (ADA) criteria were included in the cohort. Patients who had ability to read and write, physically active and have no disability and can fill a self-administrated questionnaire were eligible to participate. Participants with depression, dementia and schizophrenia and other psychological problems were not included. All these variables effect the QOL. In a research conducted by Zhang et al., he stated that numerous factors linked to QOL in patients with DM2, such as gender, age, marital status, duration of disorder, underlying pathologis and depression; hence, depressions had minor proportion 27.9% depression in patients with DM2 [19], previously, Only 1540 of the 1894 participants of sample that were eligible to participate met the inclusion requirements, with 146 being rejected. 13 individuals had dementia and 48 participants were having depression and waiting for specialist's assessment before beginning. Questionnaires were distributed to 1540 patients, and once completed; they were examined to ensure that they were completed accurately. Patients were given the option of filling out any incomplete surveys. Age, gender, profession, married status, DM2 duration, additional comorbidities, for instance obesity, hypertension, vascular and cardiac disorders and stress were also considered. A scale called Health- related quality of life was used to measure the perceived quality of life by utilizing 36 factors survey (SF-36). Physically active, discomfort, general health,

syndrome as well [10]. These problems lead patients to depression and stress. DM can trigger mood swings and hurt the self-esteem, make others frustrated [11, 12]. Life style has been highlighted as chief health care factor in these years. The aim of medical should be to recover health of patient [13]. Hence, it impacts not only the quantity but also QOL as well. This term QOL comprise the mentally, physically, social and spiritually well-being of a person. [14]. Stress due to diabetes, medication adherence, prolong duration, use of insulin, and comorbidities are including in QOL because of their impact on people with DM2 [15-19]. To make the diabetes treatment effective, there should be emotional coherence between family and patient. And blood glucose level in blood must be regulated. [20]. In few developing countries where sociocultural factors can affect quality of life and significant no of contributors and features connected to QOL can be measured, in spite of the fact that there have been various researches conducted on QOL on diabetic patients.

RESULTS

Median of age of 1394 participants studied was 62 years, and there was no gender majority (49.9% female, n = 696). Eighty-two percent of the participants 1143 were married, and 41.6% of all participants (n=580) worked as housewives (Table 1).

Gender		Overall sample	Quality of Life			p
			< 50	51-74	> 75	
		n = 1394	n = 690	n = 682	n = 22	
		n (%)				
Female	686 (49.19)	323 (46.17)	365 (53.14)	10 (44.5)	0.0421	
Male	688 (41.01)	358 (52.3)	318 (46.6)	12 (53.5)		
Age		61 (28-77)	64 (37-77)	61 (26-76)	55 (27-78)	0.0001
Marital status	Married	1133 (81.8)	589 (84.9)	519 (76.6)	20 (94.5)	0.001
	Widower	108 (7.7)	51 (7.15)	56 (81.4)	-	
	Single	82 (5.9)	27 (3.9)	54 (7.9)	1 (4.6)	
	Divorced	44 (3.1)	16 (2.22)	28 (3.95)	-	
	Other	18 (1.3)	4 (0.5)	16 (2.4)	-	
Occupation	Housewives	582 (42.6)	300 (44.2)	276 (41.3)	8 (35.8)	0.0001
	Retired	450 (31.5)	295 (42.3)	150 (21.6)	1 (4.16)	
	Employee	204 (14.6)	36 (5.14)	154 (22.83)	10 (48)	
	Other	146 (10.6)	52 (7.17)	90 (13.14)	-	
	Unemployed	9 (0.6)	4 (0.6)	6 (0.9)	2 (10.6)	
Duration (months)		245 (0-320)	242 (0-320)	136 (0-320)	70 (0-214)	0.0001

Comorbidities	0	218 (16.9)	64 (8.9)	144 (21.8)	5 (21.7)	0.0001
	1	756 (52.9)	359 (52.5)	380 (55.9)	9 (41.1)	
	2	189 (14.4)	89 (12.16)	99 (14.22)	3 (12.9)	
	3	216 (14.9)	163 (23.7)	46(6.9)	5 (21.9)	
	4	15 (1.1)	8 (1.2)	7 (1)	-	
Depression	No	349 (24.9)	69 (10.1)	258 (38.16)	18 (85.19)	0.0001
	Mild	232 (16)	131 (18.7)	92 (13.8)	-	
	Moderate	719 (52.8)	428 (62.1)	292 (42.8)	3 (13.5)	
	Severe	95 (6.81)	63 (9.1)	32 (4.8)	-	

Table 1: Diabetic patients' demographic characteristics compared to their Quality of Life

In the case of DM2, the disease lasted an average of 240 months, with comorbidities affecting 85% (1186) of patients. The most prevalent pathology was hypertension, 1044 patients (74.9% was suffering with it. 380 patients (27.2%) with dyslipidemia, Obese patients were 235 (16.8%) and with cardiac disorder there were 201 patients. According to the survey, only 25.2% (n=352) of those polled were depressed (Table 1). The middle total HRQoL total stood 50.1 facts out of a potential 100 ideas, by an all-out of 75.5 then a least of 28.6 arguments representing the best QoL. By analyzing HRQoL scale, emotional role, body ache, mental status, and physical function all variables had median lower than 50. Symptoms of depression, age and DM2 duration has negative impact on physical function, on the other hand, marital status has improved the score.; symptoms of depression have negative effect on mental stats and it aggravate the body pain. These symptoms of depressions significantly impact a negative effect on QoL across all the categories has been studied (Table 2). We found that probably half of subjects (49.5%, n = 690) had score QoL less than 50, indicating poor HRQoL, and just 1.5% (22) had a score of more than 75, indicating ideal HRQoL.

Factor	β	95% CI	p
CORPOREAL PURPOSE			
Depressing indications		-11.1 to -9.01	> 0.001
Gender	1.68	-0.81 to 4.2	NS
Age in years	-0.48	-0.61 to -0.313	< 0.001
EMOTIONAL ROLE			
Symptoms of depression	-12.1	-13.9 to -9.71	< 0.001
Age in years	-0.73	-0.96 to -0.51	< 0.001
No of c0-diseases	-8.6	-10.5 to -6.7	< 0.001
PHYSIQUE DISCOMFORT			
Symptoms of depression	-4.8	-3.5 to -6.15	< 0.001
Gender	-2.57	-5.13 to 0.07	NS
Phase (time)*	0.23	-0.08 to 0.36	NS
Period of diabetes(months)	-0.011	-0.04 to 0.011	NS
Amount of diseases	-5.65	-4.45 to -6.9	< 0.001
INTELLECTUAL FITNESS			
Miserable indications	-0.85	-0.18 to -1.58	0.014
gender	0.47	-0.82 to 1.81	NS
Era (time)*	0.07	-0.005 to 0.15	NS
Matrimonial rank	0.64	-0.038 to 1.28	NS

In determining a patient's HRQoL category, we discovered that variables like gender, age, married status, work, duration of DM2 and depression remained important. (Inadequate, acceptable, or optimum). Bench 1 demonstrations that those by an older were more likely to be retirees or housewives, and had a higher frequency of symptoms of depression than those with satisfactory HRQoL (notch better than 50). (Score greater than 50). (A score of at least 75 is required.) Logistic regression model involved all of these variables except age and symptoms of depression were present as independent factors affecting HRQoL. Depression had a greater influence on HRQoL than age (OR 1.04, 95 percent CI 1.0008 to 1.09) in this study (OR 4.4, 95 percent CI 2.03 to 9.9)(Table 3).

Features	Odds ratio	95%	P
Symptoms of depression	4.42	2.13-9.8	0.0001
Gender	0.76	0.3-1.96	NS
Stage (years)	1.05	1.0018-1.08	0.018
Matrimonial rank	2.07	0.94-4.14	NS
Profession/ Job	1.12	0.78-1.62	NS
Diabetes period	0.98	0.98-1.0054	NS
Comorbidities	0.83	0.55-1.25	NS

Table 3: Sociodemographic features of DM2 patients

DISCUSSION

Diabetes type 2 had very poor HRQoL in terms as physical function, mental body ache especially mental and

emotional health being most affected. Depression played a major role as contributor to HRQOL. This is one of few current researches that found a vast number of individuals with DM2 that exposed demographic factors also have impact on quality of life. It is also determined that gender had no effect on HRQOL, physical function, emotional and mental health status and body pain [16, 28]. The outcome that diabetic patients who have less HRQOL in line with previous research indicating DM2 has a negative impact on QOL, which has been arbitrated by aspects for example the necessity for a healthy food with full nutrition, exercise plan and special treatment plan [29, 30]. The literature on quality of life of diabetic patients and its relation with socio-demographic aspects has developed unpredictable outcomes. In previous studies, poor QOL has been linked to an illiterate and less income and female gender. [31]. Glycemic control is influenced by established factors that affect QOL like elder people, and stress can be another reason to aggravate the QOL deterioration [32]. One more essential factor is that diabetic patients are regularly faced by their situation and difficulties that come with it on a daily basis, which affects their quality of life [33]. A study of 2086 DM2 patients in the Netherlands, Wermeling et al., discovered that individuals with underlying pathologies had drastically poor health status than those patients who no other comorbidities. [34]. On the other hand, a study conducted in Singapore revealed no correlation. Despite the lack of impact, it is crucial that health care provider exercise extra vigilance when managing DM2 comorbidities, as previous research has shown that the no of comorbidities raise, QOL deteriorates and survival declines drastically. Besides, findings of this training reveal that unhappiness is widespread to the effects having DM2 and is connected to a poor perception of QOL; unhappiness must stand tested, particularly big effectors who are at higher risk for absence of incentive and expressive weariness. The analysis of DM2 produces grieving for the losing health that promotes the development of stress, and this depressed situation can enhance habits of poor eating. It is because the depression inhibits the ability to maintain a healthy life style and alleviate the risk at the onset of diabetes. It is critical to gain a better understanding of stress and challenge adhere to treatment and modification in lifestyle. In diabetes patients, depression treatment, both psychological and pharmacological, has been associated to significant therapeutic benefits. Such improvements can in mood enhancement and also in adherence to DM2 diet and treatment routines, which improves control of glycemic in blood, lowers prolong pathologies and complications, and improves QOL [35].

CONCLUSION

Over-all, Patients with DM2 have a low quality of life. One factor is depression that influences QOL, and the aged individuals which have depression had a poorer HRQOL. The outcome of this study is to demonstrate that providing integrated management techniques and support groups to DM2 patients is crucial

REFERENCES

- [1] American Diabetes Association. Standards of medical care in diabetes-2016. *Diabetes Care*. 2016;39: S1-2. doi.org/10.2337/dci16-0003
- [2] Zhang M, Hu T, Zhang S, Zhou L. Associations of Different Adipose Tissue Depots with Insulin Resistance: A Systematic Review and Meta-analysis of Observational Studies. *Sci Rep*. 2015 Dec 21; 5:18495. doi: 10.1038/srep18495.
- [3] Verma S, Hussain ME. Obesity and diabetes: an update. *Diabetes Metab Syndr Clin Res Rev*. 2017;11(1):73-79. doi.org/10.1016/j.dsx.2016.06.017
- [4] Barquera S, Campos-Nonato I, Hernández-Barrera L, Pedroza AR-DJ. Prevalence of obesity in Mexican adults 2000-2012. *Salud Publica Mex* 2013;55(2): S151-60. doi.org/10.21149/spm.v55s2.5111
- [5] Córdova-Villalobos JA, Barriguete-Meléndez JA, Lara-Esqueda A, Barquera S, Rosas-Peralta M, Hernández-Avila M, et al. Chronic non-communicable diseases in Mexico: epidemiologic synopsis and integral prevention. *Salud Publica Mex*. 2008;50(5): 419-27. doi.org/10.1590/S0036-36342008000500015
- [6] Juan López M. El análisis de la ENSANUT 2012 como contribución para las políticas públicas [The analysis of ENSANUT 2012 as a contribution for public policy]. *Salud Publica Mex*. 2013;55 Suppl 2: S79-80. doi.org/10.21149/spm.v55s2.5100
- [7] Rodríguez-Gutiérrez R, Montori VM. Glycemic control for patients with type 2 diabetes mellitus: our evolving faith in the face of evidence. *Circ Cardiovasc Qual Outcomes*. 2016;9(5):504-12. doi.org/10.1161/CIRCOUTCOMES.116.002901
- [8] American Diabetes Association. Economic costs of diabetes in the U.S. in 2012. *Diabetes Care*. 2013 Apr;36(4):1033-46. doi: 10.2337/dc12-2625.
- [9] Action to Control Cardiovascular Risk in Diabetes Study Group, Gerstein HC, Miller ME, Byington RP, Goff DC Jr, Bigger JT, Buse JB, et al. Effects of intensive glucose lowering in type 2 diabetes. *N Engl J Med*. 2008 Jun 12;358(24):2545-59. doi: 0.1056/NEJMoa0802743.

- [10] Vaidya V, Gangan N, Sheehan J. Impact of cardiovascular complications among patients with Type 2 diabetes mellitus: a systematic review. *Expert Rev Pharmacoecon Outcomes Res.* 2015 Jun;15(3):487-97. doi:10.1586/14737167.2015.1024661.
- [11] Ambriz Murillo Y, Menor Almagro R, Campos-Gonzalez ID, Cardiel MH. Health related quality of life in rheumatoid arthritis, osteoarthritis, diabetes mellitus, end stage renal disease and geriatric subjects. Experience from a general Hospital in Mexico. *Reumatol Clin.* 2015;11(2):68-72. doi.org/10.1016/j.reuma.2014.03.006
- [12] Gonzalez JS, Peyrot M, McCarl LA, Collins EM, Serpa L, Mimiaga MJ, et al. Depression and diabetes treatment nonadherence: a meta-analysis. *Diabetes Care.* 2008;31:2398-403. doi.org/10.2337/dc08-1341
- [13] Bech P. Quality of life in psychosomatic research. A psychometric model. *Psychopathology.* 1987;20(3-4):169-79. doi: 10.1159/000284496.
- [14] Ferrell BR, Dow KH, Grant M. Measurement of the quality of life in cancer survivors. *Qual Life Res.* 1995 Dec;4(6):523-31. doi: 10.1007/BF00634747.
- [15] Slevin M, Plant H, Lynch D, Drinkwater J, Gregory W. Who should measure quality of life, the doctor or the patient? *Br J Cancer.* 1988;41:243-50.
- [16] Altınok A, Marakoğlu KKN. Evaluation of quality of life and depression levels in individuals with type 2 diabetes. *J Fam Med Prim Care.* 2016;5(2):302-8. doi.org/10.4103/2249-4863.192358
- [17] Jannoo Z, Wah YB, Lazim AMHM. Examining diabetes distress, medication adherence, diabetes self-care activities, diabetes-specific quality of life and health-related quality of life among type 2 diabetes mellitus patients. *J Clin Transl Endocrinol.* 2017;26(9):48-54. doi.org/10.1016/j.jcte.2017.07.003
- [18] Koekkoek PS, Biessels GJ, Kooistra M, Janssen J, Kappelle LJRGC-I. Study group. Undiagnosed cognitive impairment, health status and depressive symptoms in patients with type 2 diabetes. *J Diabetes Complicat.* 2015;29(8):1217-22. doi.org/10.1016/j.jdiacomp.2015.07.010
- [19] Zhang P, Lou P, Chang G, Chen P, Zhang L, Li T, et al. Combined effects of sleep quality and depression on quality of life in patients with type 2 diabetes. *BMC Fam Pract.* 2016;17(1):40. doi.org/10.1186/s12875-016-0435-x
- [20] Lewko J, Zarzycki WK-KE. Relationship between the occurrence of symptoms of anxiety and depression, quality of life, and level of acceptance of illness in patients with type 2 diabetes. *Saudi Med J.* 2012;33(8):887-94.
- [21] American Diabetes Association. 2. Classification and diagnosis of diabetes. *Diabetes Care.* 2015;38(Suppl 1):S8-16. doi.org/10.2337/dc15-S005
- [22] Vilagut G, Ferrer M, Rajmil L, Rebollo P, Permanyer-Miralda G, Quintana JM, et al. The Spanish version of the short form 36 health survey: a decade of experience and new developments. *Gac Sanit.* 2005;19(2):135-50. doi.org/10.1157/13074369
- [23] Martínez-Hernández LE, Segura-Méndez NH, Antonio-Ocampo A, Torres-Salazar AM-GE. Validation of the SF-36 questionnaire in adults with asthma and allergic rhinitis in Mexican population. *Rev Med Inst Mex Seguro Soc.* 2010;48:531-4.
- [24] Vázquez CSJ. Fiabilidad, validez factorial y datos normativos del Inventario de Depresión de Beck. *Psicothema.* 1998;10(2):303-18.
- [25] Lahoud R, Chongthammakun V, Wu Y, Hawwa N, Brennan DMCL. Comparing SF-36® scores versus biomarkers to predict mortality in primary cardiac prevention patients. *Eur J Intern Med.* 2017;46:47-55. doi.org/10.1016/j.ejim.2017.05.026
- [26] Kav S, Yilmaz AA, Bulut YDN. Self-efficacy, depression and self-care activities of people with type 2 diabetes in Turkey. *Collegian.* 2017;24(1):27-35. doi.org/10.1016/j.colegn.2015.09.005
- [27] Dos Santos MA, Ceretta LB, Reús GZ, Abelaira HM, Jornada LK, Scwalm MT, et al. Anxiety disorders are associated with quality of life impairment in patients with insulin-dependent type 2 diabetes: a case-control study. *Rev Bras Psiquiatr.* 2014;36(4):298-304. doi.org/10.1590/1516-4446-2013-1230
- [28] Odili V, Ugboka L, Oparah A. Quality of life of people with diabetes in Benin City as measured with WHOQOL-BREF. *Internet J Law Healthc Ethics.* 2008;6(2):1-7.
- [29] Golicki D, Dudzinska M, Zwolak ATJ. Quality of life in patients with type 2 diabetes in Poland - comparison with the general population using the EQ-5D questionnaire. *Adv Clin Exp Med.* 2015;24(1):139-46. doi.org/10.17219/acem/38137
- [30] Lee H-J, Chapa D, Kao CW, Jones D, Kapustin J, Smith J, et al. Depression, quality of life, and glycemic control in individuals with type 2 diabetes. *J Am Acad Nurse Pr.* 2009;21:214-24. doi.org/10.1111/j.1745-7599.2009.00396.x
- [31] Gönen S, Güngör K, Çili A, Kamis U, Akpınar Z, Kisakol G, et al. Comprehensive analysis of health related quality of life in patients with diabetes: a study from Konya, Turkey. *Turkish J Endocrinol Metab.*

- 2007;11:81-8.
- [32] Wermeling PR, Gorter KJ, Van Stel HFRG. Both cardiovascular and non-cardiovascular comorbidity are related to health status in well-controlled type 2 diabetes patients: a cross-sectional analysis. *Cardiovasc Diabetol.* 2012;11:121. doi.org/10.1186/1475-2840-11-121
- [33] Shim YT, Lee JTM, et al. Health-related quality of life and glycaemic control in patients with type 2 diabetes mellitus in Singapore. *Diabet Med.* 2012;29:e241-8. doi.org/10.1111/j.1464-5491.2012.03689.x
- [34] Banner K, Lichtenauer M, Franz M, Fritzenwanger M, Kabisch B, Figulla HR, et al. Impact of diabetes mellitus and its complications: survival and quality-of-life in critically ill patients. *J Diabetes Complications.* 2015;29(8):1130-5. doi.org/10.1016/j.jdiacomp.2015.08.010
- [35] Hasan SS, Thiruchelvam K, Ahmed SI, Clavarino AM, Mamun AA, Kairuz T. Psychological health and menopause-specific quality of life of Malaysian women with type 2 diabetes. *Asian J Psychiatr.* 2016;23:56-63. doi.org/10.1016/j.ajp.2016.07.005