Mediating Roles of Coping Strategies in Relation to Internalising Problems and Quality of Life among Diabetic Patients

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Abstract

This study investigates the level of depression, anxiety, stress, anger, and quality of life in diabetic patients, and the mediating role of coping strategies in this context. This research utilizes a cross-sectional research design. The sample consists of 150 diabetic patients from different public and private diabetic centers in Multan. The Quality of Life Scale (QOLS), Novaco Anger Scale (NAS), Depression, Anxiety, and Stress Scale (DASS), and Brief Coping Scale were used as data collection tools in the present study. The findings indicate that anger is positively correlated with depression, anxiety, and stress. Similarly, the quality of life is negatively correlated with depression, anxiety, and stress in diabetic patients. Coping strategies partially mediates depression, anxiety, and stress where is non-significant with anger, and quality of life. Findings also reveal that male diabetic patients had a higher level of anger, depression, anxiety, stress, and low quality of life as compared to female diabetic patients.

Disciplinary: Health & Wellbeing, Mental Health, Clinical Psychology & Quality of Life.

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1 Introduction

The National Survey of Non-communicable diseases 2016-17 indicated that about 26% of the population suffers from diabetes that means that more than 37 million people are diabetic patients in Pakistan (Non-Communicable Diseases Survey -Pakistan, 2016). Diabetes is a non-recoverable disease, and the patients have to live with it throughout their life. Therefore, it causes many mental

health problems like anxiety, depression, and stress along with physical problems. It also affects the lifestyle of the individuals in the form of dietary habits. According to a survey in 2015, it is found that 415 million people are victims of diabetes around the world, and this disease is spreading at equal rates in both males and females. Diabetes becomes the cause of 1.5-5 million mortalities each year during 4 years from 2012 to 2015 (Basit et al., 2015).

Changes in weight, urination, thirst, and appetite are the main warning signs of diabetes. Similarly, problems in vision, tiredness, and headache, slow wound healing; itching on the skin could be the warning signs or secondary symptoms of diabetes (Din, 2014). There are some behavioral changes like irritability, hand-shaking, and uncontrollable aggression, seizure-like conditions, and unconscious which may cause death in many circumstances. It is observed that mild to moderate cases of hypoglycemia could be self-treated by taking high sugar eatables but severe cases can lead to unconsciousness which needs intensive medical care (Iqbal et.al, 2013).

Diabetes is spreading drastically in Pakistan, the prevalence of diabetes in Pakistan was 7 to 11% in 2011, and it is estimated that it will reach 15% by 2030. According to these figures, Pakistan is considered as the 7th largest country with diabetic patients, and if this situation continues then it will place Pakistan as the 4th largest country with diabetic patients. Therefore, it is very necessary to focus to make policies to prevent the prevalence of diabetes in Pakistan (IDF, 2015). Various population surveys indicated that the prevalence of diabetes is 22% in urban areas, and 17% is in rural areas of Pakistan. In Punjab, 16% of males, and 19% of females are diabetic patients respectively (Bahadar et al., 2014).

1.1 Diabetes, and Quality of Life

Health care professionals must give attention to the emotional, behavioral, and social aspects of chronic patients along with physical aspects of the disease, like diabetes. The mental health, physical, and lifestyle aspects of diabetes directly affect the patients' disease management and QOL. It is inevitable to evaluate the patient's QOL to assess the effectiveness of the biological, and psychological interventions. The assessment of the quality of life also helps to understand that how the patients are adjusting to the disease, and what are their patterns of adjustment, and how this adjustment is affecting their treatment of the disease (Barello, and Graffigna, 2015). Despite the importance, and significance of the quality of life of diabetic patients, there is no exact definition, and the aspects of quality of life are found. According to the WHO, it is important to consider the level of sickness, and treatment, and its effect on patient's physical, and mental health in the context of quality of life from a psychological perspective (WHO, 1995). The health care professionals should focus on the health-related quality of life of patients, and should help patients to improve their quality of life to better cope with the disease. Lloyd, Sawyer, and Hopkinson (2001) found the lower health-related quality of life among diabetic patients as opposed to non-diabetic patients. Diabetic patients who are less likely to be exercise, old age, and overweight are more likely to develop further complications like cardiac disease, hypertension, and neuropathic pain

(Galer et al., 2000). One study indicated that the Type of diabetes, use of multiple medicines, age of patients, other physiological complications, lack of knowledge about the disease, psychological factors, and lack of assistance, and support are the contributing factors of decreasing the QOL among diabetic patients (Chia, 2007). WHO stresses the improvement of the QOL of diabetic patients to lessen the damage of the disease (Correr et al., 2008). Improvements in quality of life not only help to improve the management of the disease but also longer the life span of diabetic patients (Solli et al., 2010).

1.2 Mental Health, and Diabetes

The mental health effects of diabetes are significantly known now a day's which are also proven by many research studies. Many mental health problems are specifically related to diabetes known as "diabetes distress" which includes negative emotions, and problems of self-management which diabetic patients have to face while living with this disease. A problem related to diabetes not only leads to psychiatric disorders but as well as decreased quality of life. The presence of mental health problems increases the risk of diabetic complications (Hagger et al., 2016). Diabetic patients have to suffer many mental health problems like diabetes distress, psychological insulin resistance, self-care, and management problems, and major depressive disorder (Winchester et al., 2016).

Depression is a common problem faced by diabetic patients. The prevalence of depressive symptoms in diabetic patients is approximately 30%, and the prevalence of major depression is approximately 10%. The risk of major depression increases as diabetes becomes longer chronic (Moussavi et al., 2007). The level of depression in diabetic patients varies from the presence of depressive symptoms to formal diagnosis of major depressive disorder, dysthymia, and adjustment disorder with depressive mood (Holt et al., 2014). Metal analysis of longitudinal studies found a 24-38% risk of depression in Type-II diabetic patients (Rotella & Mannucci, 2013). The management of diabetes requires many lifestyle changes and self-care which cause a burden on a patient that leads to depression (Nouwen et al., 2011).

Similarly, the diagnosis of diabetes leads to a 20% prevalence of anxiety, and related disorders in diabetic patients. Women, individuals with a longer diabetes diagnosis, and younger individuals with additional medications were found to have at high risk of anxiety disorders (Smith et al., 2013). Post-traumatic stress disorder was found to cause Type 2 diabetes in adults (Miller-Archie et al., 2014). Similarly, fear of complications, like changes in blood glucose level, fear of injections for insulin increases the rate of anxiety disorder in both Type 1, and Type 2 diabetic patients (Shepard, et.al. 2014). Hasan et.al. (2016) found that 14% of diabetic patients suffer from anxiety, and stress-related disorders and 28% of them suffer from anxiety, and stress.

This study aims to investigate the prevalence of depression, anxiety, stress, anger, quality of life, and coping strategies in diabetic patients regarding demographic variables.

2 Method

This research utilizes a cross-sectional research design. The sample consists of 150 diabetic patients from the different public and private diabetic centers in Multan. The Quality of Life Scale (QOLS), Novaco Anger Scale (NAS), Depression, Anxiety, and Stress Scale (DASS), and Brief Coping Scale were used as data collection tools in the present study.

The data was collected from outpatients of different government, and private diabetic hospitals with institutional approval, and the consent of the participants. The collected data were analyzed through SPSS 23. mean, SD, and correlation were conducted on collected data.

In this study, the inclusion criteria are

- o Patients above 18 years
- o Patients of both genders
- o Patients of both rural, and urban areas
- o Patients of all educational levels
- o Both married, and unmarried

The exclusion criteria are

- o Patients with chronic medical and surgical conditions
- o Patients who had other medical conditions along with diabetes
- o Patients who were required hospitalization

3 Results

Table 1 shows descriptive statistics of the overall variables.

Table 1: Descriptive statistics of participants

Factor	Category/Minimum	Frequency/Maximum	Mean	SD
Gender	Male	97	---	---
	Female	53	---	---
Qualification	Uneducated	15	---	---
	Primary	16	---	---
	Middle	14	---	---
	Secondary	46	---	---
	Higher Secondary	14	---	---
	Bachelor	18	---	---
	Master	27	---	---
Age	<30 Years	17	---	---
	30-45 Years	65	---	---
	ears	44	---	---
	>60 Years	24	---	---
Marital Status	Married	138	---	---
	Single	12	---	---
Residence	Urban	102	---	---
	Rural	48	---	---
Quality of Life	49	116	85.58	14.63
Anger	0	100	53.71	21.01
Coping Strategies	36	108	69.33	12.79
Depression	1	42	19.97	7.91
Anxiety	1	42	18.52	9.44
Stress	0	42	18.32	9.64

Table 2 represents the results of the correlation between the quality of life, anger, coping strategies, depression, anxiety, and stress. From the results, we conclude that quality of life significantly negatively

correlated with depression, anxiety, and stress but not significantly correlated with anger, and coping strategies. Similarly, anger significantly positively correlates with coping strategies, depression anxiety, and stress. Furthermore, coping strategies significantly positively correlates with depression, anxiety, and stress. Also, depression, anxiety, and stress are significantly positively correlated with each other.

Table 2: Correlation between quality of life, anger, coping strategies, depression, anxiety, and stress

Variable	1	2	3	4	5	6
1. Quality of Life	1					
2. Anger	-.073	1				
3. Coping Strategies	.056	.474**	1			
4. Depression	-.449**	.408**	.360**	1		
5. Anxiety	-.512**	.340**	.323**	.795**	1	
6. Stress	-.438**	.372**	.455**	.758**	.859**	1

** significant at p < 0.01 level.

Table 3: Regression analysis, coping strategies as mediators, anger, depression, anxiety, and stress as a predictor, and quality of life as an outcome among diabetic patients

Predictor	Path Coefficients				$a * b$ (95% CI)	R^2
	a	b	c	c'		
Anger	.288***	.133	-.051	-.089	.038 (-.022, .101)	.016
Depression	.583***	.286***	-.830***	-.997***	.167 (.056, .331)	.256
Anxiety	.437***	.283***	-.794***	-.917***	.124 (.041, .267)	.317
Stress	.603***	.368***	-.665***	-.887***	.222 (.093, .394)	.274

** *significant at p< 0.001 level.

Table 3 shows the results of regression analysis with coping strategies as the mediator variable, and quality of life as an outcome variable, to investigate the influence of coping strategies on the relationship between anger, depression, anxiety, and stress (the independent variables), and quality of life (as the dependent variable).

From the results, we conclude that coping strategies partially mediated the associations of depression, anxiety, and stress with quality of life while coping strategies do not mediate the association between anger and quality of life. To evaluate the effect size of the mediating pathway, the proportion we calculate the total effect of the independent variable on the dependent variable by coping strategies using the formula $(a \times b)/c$. The proportions of coping strategies mediation are 16.7% for depression, 12.4% for anxiety, and 22.2% for stress.

Table 4: The comparison of quality of life, anger, coping strategies, depression, anxiety, and stress between male, and female diabetic patients.

Variable	Male (n=97)	Female (n=53)	t	p	95% Confidence Interval	
	Mean ± SD	Mean ± SD			L.L	U.L
Quality of life	82.742±13.25	90.774±15.69	-3.321	.001	-12.810	-3.252
Anger	57.278±20.10	47.170±21.25	2.885	.002	3.185	17.032
Coping Strategies	70.021±13.55	69.943±11.38	.035	.486	-4.254	4.409
Depression	20.835±8.46	18.377±6.56	1.834	.035	-.190	5.106
Anxiety	19.887±9.87	16.019±8.11	2.437	.008	.732	7.004
Stress	19.516±10.49	16.132±7.48	2.077	.002	.164	6.603

From the results give in Table 4, we conclude that the male patients show higher levels of anger, depression, anxiety, and stress, while female patients show a higher level of quality of life. Coping strategies show no significant difference between male and female patients.

4 Discussion

It is evident by many studies that diabetes causes many psychological problems like depression, anxiety, and stress along with physical problems. All these conditions affect the quality of life of diabetic patients. This study's results reveal that anger is positively associated with depression, anxiety, stress, and dysfunctional coping strategies. However, quality of life is negatively correlated with depression, anxiety, and stress. Similarly, depression, anxiety, and stress were found positively correlated with each other that means that any of one leads to others. These results are similar to the results of Ornelas et al. (2017). American Diabetic Association (2014) also indicated that the burden of depression, and other mental health problems increasing drastically among diabetic patients. It may occur due to that diabetes is a long-term disease, and long-term use of medicine, and precautions in eating behavior, and other lifestyle patterns eventually lead to anger, depression, anxiety, and stress. In our finding, anger level was high among diabetic patients (mean of 53.71, and SD of 21.01). A high anger level could be due to long-term medication, and precautionary measures like changing eating habits, and lifestyle changes. The findings of our study also indicated that anger is positively correlated with depression, anxiety, and stress. This means that anger leads to DAS in diabetic patients.

Findings of this study also indicated that quality of life is negatively correlated with depression, anxiety, and stress which mean that low quality of life leads to depression, anxiety, and stress in diabetic patients, these findings are consistent with the findings of Al Hayek (2014), Al-Khawaldeh (2012), and Markowitz (2011). Other findings also indicated that diabetic patients have a low quality of life in all aspects as compared to non-diabetic patients, therefore there is a need to focus on the improvement of the quality of life of diabetic patients for better management of the disease, and also to the prevention of other mental, and physical complications in diabetic patients (O'Reilly, 2011; Bosić-Živanović, 2012). A meta-analysis of 20 studies indicated that physical activity for diabetic patients is very important to enhance the quality of life (Cochran et al., 2008).

The mediation analysis of our study indicated that coping strategies partially mediate the association between depression, anxiety, stress, and quality of life but not mediate anger. The proportions of coping strategies mediation were 16.7% for depression, 12.4% for anxiety, and 22.2% for stress. It means that the dysfunctional coping strategies directly lead to anger, and then anger leads to depression, anxiety, stress, and low quality of life. It could happen due to that anger cause decrease self-management, and self-care behaviors which then cause other mental health, and medical complications.

Findings of this study also indicate that male diabetic patients have a higher level of anger, depression, anxiety, and stress, and low quality of life as compared to female diabetic patients, whereas female diabetic patients had higher quality of life as compared to male diabetic patients. This may be due to cultural factors like in Eastern culture mostly females do only housework, and they had not to face social, and occupational problems which males have to commonly face.

5 Conclusion

Mental health problems and quality of life in diabetic patients are mostly ignored in Eastern cultures, and low economic status countries like Pakistan causing many mental, and medical complications in diabetic patients. This study's findings reveal that anger is positively correlated with depression, anxiety, and stress in diabetic patients, and quality of life is negatively associated with DAS in diabetic patients. Findings also reveal that coping strategies partially mediates the quality of life, DAS, and male diabetic patients show a high level of rage, depression, anxiety, and stress as compared to female diabetic patients, and female diabetic patients have a higher level of quality of life as compared to male diabetic patients.

6 Availability of Data, and Material

Data can be made available by contacting the corresponding authors.

7 References

Al Hayek, A. A., Robert, A. A., Al Saeed, A., Alzaid, A. A., & Al Sabaan, F. S. (2014). Factors associated with health-related quality of life among Saudi patients with Type 2 diabetes mellitus: a cross-sectional survey. *Diabetes & metabolism journal*, *38*(3), 220.

Al-Khawaldeh, O. A., Al-Hassan, M. A., & Froelicher, E. S. (2012). Self-efficacy, self-management, and glycemic control in adults with Type 2 diabetes mellitus. *Journal of Diabetes, and its Complications*, *26*(1), 10-16.http://dx.doi.org/10.1016/j.jdiacomp.2011.11.002

American Diabetes Association. (2014). National diabetes statistics report. http://www.diabetes.org/diabetesbasics/statistics/

Barello, S., & Graffigna, G. (2015). Engaging patients to recover life projectuality: an Italian cross-disease framework. *Quality of Life Research*, *24*(5), 1087-1096.

Bosić-Živanović, D., Medić-Stojanoska, M., & Kovačev-Zavišić, B. (2012). Kvalitet života obolelih od dijabetesa melitusa tipa 2. *Vojnosanitetski pregled*, *69*(10), 858-863. http://dx.doi.org/10.2298/VSP1210858B

Chia, L. (2007). The characteristics that associate with health-related quality of life in patients with Type-2 diabetes. Doctoral dissertation, University of Pittsburgh.

Cochran, J., & Conn, V. S. (2008). Meta-analysis of quality of life outcomes following diabetes self-management training. *The Diabetes Educator*, *34*(5), 815-823. http://dx.doi.org/10.1177/0145721708323640

Correr, C. J., Pontarolo, R., Melchiors, A. C., Rossignoli, P., Fernández-Llimós, F., & Radominski, R. B. (2008). Translation to Portuguese, and validation of the Diabetes Quality of life measure (DQOL-Brazil). *Arquivos Brasileiros de Endocrinologia & Metabologia*, *52*(3), 515-522. DOI: 10.4172/2375-4273.1000216

Hagger, V., Hendrieckx, C., Sturt, J., Skinner, T. C., & Speight, J. (2016). Diabetes distress among adolescents with Type 1 diabetes: a systematic review. *Current diabetes reports*, *16*(1), 9.

Hasan, S. S., Clavarino, A. M., Mamun, A. A., & Kairuz, T. (2016). Anxiety symptoms, and the risk of diabetes mellitus in Australian women: evidence from 21-year follow-up. *Public health*, *130*, 21-28.

Holt, R. I. G., de Groot, M., Lucki, I., Hunter, C. M., Sartorius, N., & Golden, S. H. (2014). NIDDK international conference report on diabetes, and depression: Current understanding, and future directions. *Diabetes Care, 37,* 2067–2077. http://dx.doi.org/10.2337/dc132134

Lloyd, A., Sawyer, W., & Hopkinson, P. (2001). Impact of long-term complications on quality of life in patients with Type 2 diabetes not using insulin. *Value in Health*, *4*(5), 392-400.

Markowitz, S. M., Park, E. R., Delahanty, L. M., O'Brien, K. E., & Grant, R. W. (2011). Perceived impact of diabetes genetic risk testing among patients at high phenotypic risk for Type 2 diabetes. *Diabetes care*, *34*(3), 568-573.

Moussavi, S., Chatterji, S., Verdes, E., Tandon, A., Patel, V., & Ustun, B. (2007). Depression, chronic diseases, and decrements in health: results from the World Health Surveys. *The Lancet*, *370*(9590), 851-858.

Nouwen, A., Nefs, G., Caramlau, I., Connock, M., Winkley, K., Lloyd, C. E., . . . the European Depression in Diabetes Research Consortium. (2011). Prevalence of depression in individuals with impaired glucose metabolism or undiagnosed diabetes: A systematic review, and metaanalysis of the European Depression in Diabetes (EDID) Research Consortium. *Diabetes Care, 34,* 752–762.

O'Reilly, D. J., Xie, F., Pullenayegum, E., Gerstein, H. C., Greb, J., Blackhouse, G. K., ... & Goeree, R. A. (2011). Estimation of the impact of diabetes-related complications on health utilities for patients with Type 2 diabetes in Ontario, Canada. *Quality of Life Research*, *20*(6), 939-943. http://dx.doi.org/10.1007/s11136-010-9828-9

Ornelas, A. C. C., Alves, V. M., Carta, M. G., Nardi, A. E., & Kinrys, G. (2017). Mental disorders in subjects with diabetes: a systematic review. *Health Care Current Reviews*, 5(216), 2.

Rotella, F., & Mannucci, E. (2013). Depression as a risk factor for diabetes: A meta-analysis of longitudinal studies. *The Journal of Clinical Psychiatry, 74,* 31–37. http://dx.doi.org/10.4088/JCP.12r07922

Shepard, J. A., Vajda, K., Nyer, M., Clarke, W., & Gonder-Frederick, L. (2014). Understanding the construct of fear of hypoglycemia in pediatric Type 1 diabetes. *Journal of pediatric psychology*, 39(10), 1115-1125.. http://dx.doi.org/10.1093/jpepsy/jsu068

Smith, K. J., Béland, M., Clyde, M., Gariépy, G., Pagé, V., Badawi, G., . . . Schmitz, N. (2013). Association of diabetes with anxiety: A systematic review, and meta-analysis. *Journal of Psychosomatic Research, 74,* 89-99. http://dx.doi.org/10.1016/j.jpsychores.2012.11.013

Solli, O., Stavem, K., & Kristiansen, I. S. (2010). Health-related quality of life in diabetes: The associations of complications with EQ-5D scores. *Health, and quality of life outcomes*, 8(1), 1-8. http://dx.doi.org/10.1186/1477-7525-8-18

Whoqol Group. (1995). The World Health Organization quality of life assessment (WHOQOL): position paper from the World Health Organization. *Social science & medicine*, 41(10), 1403-1409.

Winchester, R. J., Williams, J. S., Wolfman, T. E., & Egede, L. E. (2016). Depressive symptoms, serious psychological distress, diabetes distress, and cardiovascular risk factor control in patients with Type 2 diabetes. *Journal of Diabetes, and its Complications*, 30(2), 312-317.

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