

# Adherence to Treatment of Diabetes in Patients Suffering from Co-Morbid Depression

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## ABSTRACT

**Objective:** The objective of this study was to explore the adherence to diabetic management in patients with co-morbid depression presenting in Diabetes Management Centre, Services Hospital Lahore and to compare it with adherence to treatment of diabetes in patients not suffering from co-morbid depression.

**Method:** The sample (N=94) was all diabetic patients with either type 1 or type 2 diabetes and presenting at outpatient department, Diabetes Management Centre, Services Hospital Lahore and who are suffering from depression according to DSM-5 Criteria. Cross-sectional study designed was being used.

**Result:** A one-way anova was used. Results showed that there was a significant difference in adherence to treatment between diabetic patient with co-morbid depression and diabetic patient without co-morbid depression at  $p < .05$  for four groups [F (3, 88) = 6.108,  $P = 0.001$ ]. A Tukey post hoc test revealed that adherence of diabetic patient with no depression ( $97.43 \pm 14.69$ ) had statistically significant different than diabetic patient with mild depression ( $77.85 \pm 21.76$ ,  $p = .002$ ) and moderate depress diabetic patient ( $80.43 \pm 28.20$ ,  $p = .027$ ). There was no statistically significant difference between diabetic patient without depression and with severe depression ( $90.27 \pm 21.38$ ,  $p = .922$ ).

**Conclusion:** The study concluded that diabetic patient without co-morbid depression are better adhered to treatment than those with comorbid depression diabetic patient. The impact of demographic factors should explore in future study.

**Keywords:** Adherence, diabetes, co-morbid depression

## INTRODUCTION

The socio-economic burden of diabetes is a matter of concern for many health care systems throughout the world<sup>1</sup>. Prevalence of diabetes is on the surge in Pakistan with More than 6.9 million people affected by diabetes in Pakistan<sup>2</sup>. Depression is twice as common in people suffering from type 2 diabetes<sup>3</sup>. Also the risk for depressive symptoms is high for adolescents with type 1 diabetes mellitus, with prevalence estimates ranging from two to three times that of the general population<sup>4</sup>. The presence of depression in patients with diabetes was associated with higher risk of developing chronic kidney disease, increased cardiovascular events and increased all-cause mortality compared with non-depressed patients<sup>5</sup>.

Moreover, Diabetes-related emotional distress and depressive symptoms act as risk factors for type 2 diabetes medication non compliance<sup>6</sup>. Depression and resulting hopelessness have significant negative impact on adherence levels<sup>7</sup>. This can lead to decreased quality of life of diabetic patient by affecting the capacity to maintain medication vigilance and maintaining good diet and other lifestyle factors<sup>8</sup>.

Therefore, the treatment of depressive symptoms may allow for better diabetes mellitus management through improved adherence<sup>9</sup>. The rationale of this study was to determine the adherence of diabetic patients with co-morbid depression. This in turn will highlight the importance of prompt diagnosis and treatment of co-morbid depression in diabetics. Integrating depression treatment with diabetes care can make the diabetic management more holistic<sup>8</sup> and prevent future secondary complications due to poor compliance to the treatment<sup>3,5,7</sup>.

Furthermore, depression was not only having emotional impact as well as compromises functioning., depression had been twice as common among diabetic patients as compared to non-diabetic patients<sup>9</sup>. Major depression is associated with a probability of neglected prescription. Good adherence was related to patients whom were not suffering from major depression<sup>15</sup>. Depression is also related to no adherence in diabetes self-care which include dietetic restrictions, medication compliance, and blood sugar monitoring that can result in worse overall clinical outcomes<sup>13</sup>.

Moreover, non-depressive patient with diabetes explained less diabetic warning sign than depress patient with same illness. It might be result of emotional response to extensive period of depression<sup>13</sup>. Depression was one of the reason behind in complication of adhering to prescription. It was suggested in study that patient had difficulty to retain medication due to major depression<sup>9</sup>. A most important obstacle in tackling any disease or disorder was poor adherence, particularly amongst patients with comorbid diabetes and depression<sup>16,13</sup>.

Therefore, most of the patient were become exposed to multiple complication due to non-adherent attitude toward treatment. Non-adherent treatment leads to increased risk to multiple complication. To improve adherence to treatment patient should integrate and adapt to preference, tolerance, and simplicity to manage comorbid depression and diabetes<sup>16</sup>.

## METHOD

There is a significant difference between diabetic patient with co-morbid depression and diabetic patient without co-morbid depression in adherence to treatment.

In this research we used purposive sampling technique; the use of probability sampling was not considered due to limited resources. The sample was all diabetic patients with either type 1 or type 2 diabetes and presenting at outpatient department, Diabetes Management Centre, Services Hospital Lahore and whom are suffering from depression according to DSM-5 Criteria. Those having any secondary diabetic complications and any other psychiatric disorder and with other physical/surgical/cognitive issue diabetes were excluded from the study sample. The participants were included in the study after an informed consent on the basis of availability and their willingness to fill the questionnaire.

Brief Adherence Rating Scale was used to collect data from sample. It was Published in 2008 by Byerly, M.J., Nakonezny, P.A. & Rush, A.J. The objective of scale to assess the oral medication adherence among patients presenting to outpatient's clinic<sup>10</sup>.

The research survey method was being used in this study. This particular questionnaire has been chosen according to the characteristics of research population and the efficiency of data collection. It had been given great consideration that questionnaire

was not seamlessly long and difficult to fill by a respondent. One of the major advantage is using these questionnaire is low cost and availability and less no of item.

Before starting data collection, permission was taken from head of institute and authority letter for data collection from institute was acquired from administration office. Respondents were approached by researcher to collect data. Informed consent was taken from participants of this study. It is also being guaranteed that personal or other information provided by participant has never been disclosed without their consent. During data collection asked the participant to fill the questionnaire with utmost honesty and if there has been any issue regarding comprehend the question they are welcome to inquire any question. Any inquiry from institute administration and participants had been answered regarding research or instrument. Data collection was conducted in relaxed environment.

**RESULTS**

The descriptive characteristics of demographic variables

Demographics Characteristics of Sample (N=94)

Variables	Categories	f (%)
Gender	Male	39(41.5)
	Female	55(58.5)
Marital status	Single	6(6.4)
	Married	87(92.6)
	Widow	1(1.1)
Level of Education	Uneducated	34 (36.2)
	Primary	12 (12.8)
	Secondary	12 (12.8)
	Matric	21 (22.3)
	FA/FSc	5 (5.3)
	BA/BSc	5 (5.3)
Occupation	Masters	4 (4.3)
	office work	16 (17.0)
	shopkeeper and other small business	8 (8.5)
	related to educational field	3 (3.2)
	mason, daily earner	14 (14.9)
	housewife	50 (53.2)
Address	unemployed	3 (3.2)
	Rural	4 (4.3)
Illness duration	urban	90 (95.7)
	0-5	49 (52.1)
	6-8	16(17.0)
	9-11	8 (8.5)
	12-14	8 (8.5)
	15-17	7 (7.4)
Compliance	18-20	6 (6.4)
	Poor	20(21.3)
Complication	Good	74(78.7)
	No	26(27.7)
Other illness	Yes	68(72.3)
	No	33(35.1)
Age	Yes	61(64.9)
	14-26	1 (1.1)
	26-38	4 (4.3)
	39-50	23 (24.5)
	51-62	35 (37.2)
	63-74	21 (22.3)
Depress or not	75-86	10 (10.6)
	Not Depressed	53(56.4)
	Mild Depression	20 (21.3)
	Moderate Depression	15 (16.0)
Registration duration	Severe Depression	6 (6.4)
	first visit	58(61.7)
	1 year	13(13.8)
	2 year	10(10.6)
	3 year	4(4.3)
	4 year	3(3.2)
	5 years	2(2.1)
	6 years	2(2.1)
7years	1(1.1)	
	8years	1(1.1)

In this study sample was Male 39(41.5%) Female 55(58.5%). Sample was further categorized on marital bases status, level of education, occupation, address, age, compliance, complication, other illness, depression and duration of registration.

Comparison in adherence between diabetic patient with co-morbid depression and diabetic patient without co-morbid depression (N=94)

	SS	df	MS	F	Sig.
Between Groups	7170.009	3	2390.003	6.108	.001
Within Groups	34436.197	88	391.320		
Total	41606.207	91			

df=3, P=.001

A one-way between subjects Analysis of Variance Test was used to compare adherence to treatment between diabetic patient with co-morbid depression and diabetic patient without co-morbid depression. Results showed that there was a significant difference in adherence to treatment between diabetic patient with co-morbid depression and diabetic patient without co-morbid depression at p<.05 for four groups [F (3, 88) =6.108, P=0.001]. A Tukey post hoc test revealed that adherence of diabetic patient with no depression (97.43± 14.69) had statistically significantly different than diabetic patient with mild depression (77.85± 21.76, p = .002) and moderate depress diabetic patient (80.43±28.20, p = .027). There was no statistically significant difference between diabetic patient without depression and with severe depression (90.27± 21.38, p = .922).

**DISCUSSION**

The main purpose of this study was to explore differences in adherence between diabetic patient with co-morbid depression and diabetic patient without co-morbid depression. The International Diabetes Federation (IDF) stated in its Atlas 5th edition the prevalence for Pakistan to be 6.8%, aged 20–79 years<sup>11</sup>. The medication adherence of the patients is very low (P value<0.01) with sample of (N=204, 79.4%) diabetic patient. Health professionals struggled to deal with the disease population. Diabetic population of the country scarcely got treated and prescribed rationally for their ailments but adherence to medication was generally not a focal point for the health care professionals<sup>12</sup>.

The present study indicated there was a significant difference in adherence between diabetic patient with co-morbid depression and diabetic patient without co-morbid depression at p<.05 for four groups [F (3, 88) =6.108, P=0.001]. A Tukey post hoc test revealed that adherence of diabetic patient with no depression (97.43± 14.69) had statistically significantly different than diabetic patient with mild depression (77.85± 21.76, p = .002) and moderate depress diabetic patient (80.43±28.20, p = .027). There was no statistically significant difference between diabetic patient without depression and with severe depression (90.27± 21.38, p = .922).

Katon in his study discovered the course of depression in patients with both diabetes and depression is chronic and severe. More than 80% of patients with diabetes and depression will experience a reoccurrence of depressive symptoms over a 5-year period. Non-adherence is being related to depression in diabetes self-care that include different factors as nutritional restraints, treatment compliance, and blood sugar monitoring that is not better in overall clinical outcomes<sup>13</sup>. Another study finding (P < 0.001) supported that distress due to diabetes (P < 0.01) and severity of depression symptom (P < 0.05) posed as risk factors for type 2 diabetes medication non-adherence<sup>7</sup>. Contributing factors for poor medication adherence were increased morbidity and mortality; and increased expenses of health care for out-patients, visits to hospital and emergency room and managing complications of diabetes suggested by Polonsky & Henry. No less than 45% of patients suffering from type 2 diabetes (T2D) unable to get tolerable glycemic control (HbA1c <7%)<sup>14</sup>.

Furthermore, Comorbid psychological conditions such as depression could further complicate adhering to medication. In general, major depression was linked with patient struggle to maintain medication adherence but not with preventive services for diabetes<sup>9</sup>. Major depression was associated with a probability of neglected prescription. Good adherence was assumed relate to patients whom were not suffering from major depression<sup>15</sup>.

Likewise, another study evaluated that deficient glycemetic control was linked to poor adherence. Results was shown in the linear mixed model that mean glycosylated hemoglobin A1c (A1C) decreased by 0.24 (P < 0.001) for each 10% increase in MPR (95% CI = -0.27, -0.21) after regulating for baseline glycosylated hemoglobin A1c (A1C) and additional confounding variables<sup>16</sup>. Another study with a sample (n=100) proposed that level of non-adherence was estimated significantly by both depression and hopelessness<sup>7</sup>.

**Strength and limitation:** This study was good estimation of adherence rate among diabetic patient with co-morbid depression and without comorbid depression. Previous studies in Pakistan mostly discuss association between depression and diabetes and prevalence. Present study explored the difference in adherence among co-morbid depressive diabetic patients (mild, moderate and severe) and diabetic patient without depression.

Limited sample and lack of diversity in a sample were main limitation. Data was collected from one Govt. hospital. Questionnaire was self-reported which indicated higher chance of biases response.

## CONCLUSION

Current study concludes that diabetic patients without co-morbid depression are significantly better adherent to treatment than those with comorbid depression. Furthermore, demographic variables such as social economic status, family support, availability of medication and cost of prescribed doses should also be explored as well as the impact cultural values have on compliance. This study provides support for future studies which explore adherence of treatment in psychological disorder and other medical issues in Pakistan.

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