

Neurocognitive Functioning And Interpersonal Difficulties In Diabetic Mellitus Type II Patients

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Abstract

Objectives: To determine the level of Neurocognitive Functioning, and Interpersonal difficulties in People with Diabetes Mellitus type II.

Material and Method: A purposive sampling strategy was used. A sample (N=100) with age range (40-60) years was taken in the study, in which 46% Men or 54% Women Diabetes Mellitus type II patients were included. The research design was cross-sectional. Neuro-Cognitive Assessment Battery and Interpersonal Relationship Scale for Diabetic Patients were used.

Results: Pearson Correlation analysis results showed that there was a positive significant relationship between neurocognitive functioning and interpersonal difficulties. Hierarchical Regression analysis showed education level was a predictor of interpersonal difficulties in diabetic mellitus type II patients with poor neurocognitive functioning. Limitations and suggestions are discussed.

Keywords: Neurocognitive functioning, Interpersonal Difficulties, Diabetic Mellitus Type II

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1. Introduction

Diabetes is a risky and genuine illness; it is managed very well through appropriate medication and monitoring ⁴. Diabetic mellitus has been a major health problem in recent decades ¹⁵.

According to WHO diabetes will be the seventh major cause of death in 2030 ⁴. The long-term damage, and failure, of different organs, especially the vital organs of the body like kidneys, liver, heart, blood vessels and nerves has been seen in diabetic patients due to chronic hyperglycemia ¹⁰.

The frequency of both diabetes mellitus type I and II is increasing worldwide, but the prevalence of diabetes mellitus Type 2 is rising much more quickly ⁴.

Cognitive decrement in diabetic patients developed slowly over a progressive period.

The decrement in psychological functioning mostly seems in different areas like verbal memory and neurocognitive capacities ⁵.

In the latest research, Diabetes Mellitus has been identified as a significant risk factor for dementia and cognitive impairments in adult patients ²⁰.

Diabetes mellitus is linked with changes in brain structure and decrements in cognitive function. People with both diabetes types I and II have been shown to have mild to moderate reductions in cognitive function as measured by neuropsychological testing

compared to non-diabetic controls. Diabetes mellitus Type 2 has also been associated with a 50% increased risk of dementia ⁴.

For more than one hundred years, diabetes has been a recognized disease which has an impact on the brain. Researchers and clinicians of the early 19th century recognized that people with diabetes frequently complained of attention and poor memory ¹.

Diabetes mellitus is a family disease, and the medical issues of the family are interlocking ¹⁶ A relationship is a tight and deep connection or association between at least two or more two individuals ⁶.

Studies have indicated that social relationships influence diabetic well-being results, for example, psychological fitness personal satisfaction, and glycemic control in a progressive manner ⁶. Interpersonal relationships in social setups have tremendous effects on mental well-being, physical health, health behaviour and death risk. Mental health problems decrease If the social relationship with others is stable and healthy ¹⁹.

Family capacity is characterized as the impression of the behaviour of relatives in connection to everyday diabetes care choices and their psycho-physical associations ⁶.

2. Materials & Methods

A sample of diabetic mellitus type II patients (N=100) with age range (40-60) years, in which 46%

Men or 54% women were included. The data was collected through a purposive sampling technique during July 2019- October 2019.

The research design was cross-sectional. In this research, only diabetic melilotus type II patients were taken from different hospitals in Lahore. After getting permission from the concerned authorities and explaining the nature of the research to the participants. The data collection was started. Those patients who were suffering from type I or gestational type, psychiatry illness, or any other illness (like hepatitis, jaundice etc.) were not included in it.

The questionnaire with demographic data, Neuro-Cognitive Assessment Battery ¹⁴ and Relationship Scale for Diabetic Patient ⁹ were used in this research.

For assessment of neurocognitive functioning the 5 subtests finalized out of 7 included; Digit span for verbal attention, Paired Associate Learning Test for verbal memory, Block Design for spatial abilities and Non-Verbal Learning Test (NFLT) for visual memory. The internal consistency of NCAB was established again for the diabetic population ($N=100$) by calculating the Cronbach Alpha of total NCAB was 0.80 and of all 5 subtests which are divided into 2 categories Ver.CA (factor 1) and Vis.CA (factor 2) was 0.85 or 0.75 respectively.

The scale of interpersonal difficulties consisted of 34 items which were further divided into three factors. In which coexistence (13 items), companionship (13 items), and accommodating (8 items) factors were included.

Cronbach alpha for the relationship scale was .83 and for its three factors, it was .83, .76, .76, respectively. These values showed the internal consistency of scale and its factors up to medium level. All aspects of the research were explained. Confidentiality was guaranteed to the participants. The test material was in the preferred language (Urdu). Every participant has the right to refuse and withdraw from the research without any consequence. All data analysis was performed using SPSS statistic 21.

3. Results

Bivariate correlation results show that Neurocognitive functioning and interpersonal difficulties positively correlate with each other.

“Companionship” one of the factors of the interpersonal difficulties scale also showed a significant relationship with neurocognitive functioning, it means if there is good cognitive functioning increases

companionship between family and patient and these both support each other as shown in table 2.

The demographic data of the diabetic melilotus type II patients is in Table 1.

Table 1 Demographic Information of the Participants (N=100)

Variables	<i>f</i>	%
Age		
40-50	53	53%
50-60	47	47%
Gender		
Men	46	46%
Women	54	54%
Education		
Illiterate	50	50%
Matric and above	50	50%
Glycaemia control before a meal		
Control<130	7	7%
Uncontrolled>130	93	93%
Glycaemia control after a meal		
Control<150	4	4%
Uncontrolled>150	96	96%
Heart disease		
Yes	21	21%
No	79	79%
Blood pressure		
Yes	66	66%
No	34	34%
Sugar control by insulin or medicine		
Insulin	63	63%
Medicine	47	47%

n = sample size; f = frequency

The above table 3 indicates that in Step I, step II and Step III level of education was found to be a positive predictor of interpersonal difficulties among diabetes mellitus type II patients. On the other hand, age, gender, blood pressure, and heart disease were not found to be significant predictors of interpersonal difficulties in diabetes mellitus type II patients. In steps II and III, blood and heart disease and NCAB were not found to be predictors of interpersonal difficulties in diabetic patients. Results of Table 4 showed that there were no differences in gender roles in the experience of neurocognitive functioning and interpersonal relationships in patients with diabetes mellitus type II.

Men are not significantly different from women on these measures.

Table-2 Correlation between Neurocognitive Functioning, and Interpersonal Difficulties (N=100)

	NCAB	F1	F2	F3	IRS
NCAB	-	.14	.23*	.16	.19*
IRS F1	-	-	.89***	.93***	.97***
IRS F2	-	-	-	.91***	.96***
IRS F3	-	-	-	-	.97***
Total IRS	-	-	-	-	-
<i>M</i>	80.82	38.49	37.87	23.06	99.42
<i>SD</i>	32.12	7.96	8.03	5.05	20.43

.NCABD=Neurocognitive Assessment Battery; TAD=Treatment Adherence; IRS F1 =Coexistence; IRS F2= companionship; IRS F3 =Accommodating IRS=Interpersonal Relationship *p<.05. **p<.01. ***p<.001.

Table 3 Hierarchical Regression Analysis of Predictors of Interpersonal Relationship in Diabetes Mellitus Type II Patients (N= 100)

Models	SEB	β	t	p<
Step I (R= .258, ΔR ² =.066)				
Gender	.503	-.01	-.12	.90
Age	1.2	-.03	-.29	.76
Education	5.0	.28	2.4	.01*
Step II (R=.277, ΔR ² = .027)				
Heart Disease	1.4	.29	.27	.78
Blood Pressure	4.3	.10	1.0	.32
Education	5.6	.24	2.4	.01*
Step III (R= .306, ΔR ² .094)				
NCAB	.86	.13	1.3	.08
Education	4.5	.24	2.1	.03*

Step I, F (2, 108) =4.85, *p<.05, Step II, F (6, 104) = 3.67, *p<.05, Step III, F (12, 98) =2.35, *p<.05

Table 4 Gender-wise Difference Across Neurocognitive Functioning and Interpersonal Relationship. (N=100)

Measures	Men (n=46)		Women (n=54)		t	p	df	95% CI		Cohan's d
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				<i>LL</i>	<i>UL</i>	
NCAB	82.22	30.17	79.63	33.93	.40	.47	98	-10.25	15.43	0.08
Total IRS	100.3	21.50	98.59	19.64	.43	.45	98	-6.37	9.96	0.08
IRS F1	38.80	8.24	38.22	7.78	.36	.39	98	-2.60	3.76	0.07
IRS F2	38.24	8.59	37.56	7.59	.42	.25	98	-2.53	3.89	0.09
IRS F3	23.35	5.30	22.81	4.87	.52	.60	98	-1.48	2.55	0.10

df = 98

Note. NCAB=Neurocognitive Assessment Battery; IRS=Interpersonal Relationship; IRS F1 =Coexistence; IRS F2= companionship; IRS F3 =Accommodating

To sum up the results positive significant relationship has been seen between neurocognitive functioning and interpersonal difficulties. On the other hand, the results of hierarchical regression analysis indicated that education would predict less and higher difficulties in diabetic patients. It means educated people face fewer difficulties in their relationships with others. Gender difference was not seen in neurocognitive functioning and interpersonal difficulties.

5. Discussion

To our knowledge, it was the first study in Pakistan that showed a direct relationship between neurocognitive functioning, and interpersonal difficulties in diabetic mellitus type II patients. There was a positive relationship between neurocognitive functioning and interpersonal difficulties in diabetic mellitus type II patients. These findings revealed the importance of clinical meaning for individuals living with diabetes. In this study, the people with high blood sugar resulted in slower responses and increased errors. When performing mathematical and basic verbal tasks, which are important in various daily functions, such as insulin dosing, balancing, calculating, verbal, and visual tasks. Which affects their daily life and relationships with others⁸. Another study result shows that diabetic people performed significantly worse on information-processing speed, executive functions, memory functions, attention, and language comprehension. that's why, these people face difficulties in their lives, especially in a social domain like relationships with others and daily tasks². A study shows that men and women have different behaviours and attitudes correlated to diabetes care¹¹. women and men have separate illness preferences¹⁸. Diabetic women do extra care about their illnesses, and the different well begins behaviours of the women during their illness like more rest, seeking medical attention and being more likely to recognize symptoms of illness. Men also report fewer symptoms of illnesses than women¹⁷. Some of these differences may have evolved from the distinct roles that men and women traditionally have played within the family structure, with women having greater responsibilities for family health. However, in this study, there were no gender differences in the neurocognitive functioning and interpersonal difficulties in diabetic patients.

Some previous studies suggested that a high level of social support was related to the improvement of diabetes. Another study found that having high social support prompted controlling their diabetes effectively¹³. social sports positive effect on glycemic control. Since diet and exercise are a fundamental part of diabetes remedial action and the executives, association in sports likely adds to great glycemic control. We guess that social support may beneficially affect glycemic control¹².

5. Conclusion

This research would be helpful to see how the cognitive decline in diabetic patients will develop over time and how it affects their daily and social lives.

CONFLICTS OF INTEREST- None

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Contributions:

N.R - Conception of study

N.R - Experimentation/Study Conduction

N.R - Analysis/Interpretation/Discussion

N.R - Manuscript Writing

N.R, U.B - Critical Review

N.R, U.B - Facilitation and Material analysis

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