

# The Effect of Perceived Stress and Family Functioning on People with Type 2 Diabetes Mellitus

BHAGYASHREE BHANDARY<sup>1</sup>, SATHEESH RAO<sup>2</sup>, SANAL T.S.<sup>3</sup>

## ABSTRACT

**Background:** Various studies have suggested that support from a patient's family can facilitate his/her recovery from a physical illness and improve the ability of the patient to deal with consequences of Type 2 Diabetes. Stress is considered to play a major role in influencing Type 2 Diabetes Mellitus.

**Aim:** To determine the roles of Perceived Stress and Family functioning on behaviours of individuals with Type 2 Diabetes Mellitus.

**Material and Methods:** The present study included 250 Diabetics as per the WHO criteria and 250 Non-Diabetics. Questionnaires were given to them to obtain data.

**Results:** Stress was found to be high among Diabetics (22.17%) as compared to that in non-Diabetics (16.92%). Family assessment showed a significant difference among its subscales when it was compared between Diabetics and Non-Diabetics.

**Conclusion:** Perceived stress influences Type 2 Diabetes Mellitus. Role played by the Family is significant in managing Diabetes.

**Keywords:** Perceived stress, Family functioning, Type 2 Diabetes

## INTRODUCTION

India, having the highest number of diabetic patients in the world, is considered as the Diabetes capital of the world. The International Journal of Diabetes says that there is an alarming rise in prevalence of diabetes. The World Health Organization has estimated that mortality which resulted from diabetes was very high and that it was expected to increase in the coming years. Familial influence plays a larger role, both, in the aetiology and management of Type 2 Diabetes Mellitus.

Emotions play a major role in the link between the world that we inhabit and our immune responses. This is conceptualized within the 'bio psychosocial' model of health, which emphasizes the complex interaction between biological factors and physiological systems (life sciences), psychological processes, thoughts, feelings, behaviours, the social and cultural contexts in which people live and their children grow up. This field of study provides strong evidence to support the need for holistic care [1]. The relationship between diabetes and the psychological impact that it makes, has to be recognized at different stages of disease [2].

## MATERIAL AND METHODS

This work was carried out in and around Mangalore city in Karnataka state, where we could find rapid urbanization. Case-control study design was adopted. Total sample size of subjects was 500, which included 250 Type 2 Diabetes Mellitus subjects, as per the WHO criteria and 250 Non-Diabetics. Patients were chosen randomly for both case and control studies and they belonged to different economic classes. Subjects were selected from in and around Dakshina Kannada District, India. Questionnaires were given to patients who were graduates and above, for their self assessments. Researchers personally assisted those who were illiterate and who needed assistance in understanding the questionnaire. Total time taken for filling up the questionnaire was 45min. Age—sex—religion—matching data were obtained. Patients' consent were taken. Ethical clearance was taken for conducting the study. Perceived stress scale and Family assessment Device were used to collect the data.

## STATISTICAL ANALYSIS

For obtained parameters, analysis was done by using the unpaired t-test, Chi-Square and Pearson's Correlation co-efficient test and a p-value of <0.05 was considered to be significant.

## RESULTS

Our study included 500 subjects who consisted of 250 Diabetics and 250 Non-Diabetics. [Table/Fig-1] shows the demographic profile of the study population. Among the various occupations, group prevalence of diabetes was found to be high among business category (36.0%), followed by that which was seen among housewives (20.40%). Prevalence of Diabetes was found to be high among subjects with graduate qualification (34.0%) as compared to that which was seen among those with any other level of education. It also showed that most of the Diabetics were married, which was indicated by the score of 93.6% and among Non-Diabetics, 90.4% were married. This difference was statistically significant. The prevalence of Diabetes among widows and singletons was found to be not statistically significant. Among the Diabetics, only 42% were found to have a family history of Diabetes and among Non-Diabetics, 94.4% did not have any association with family history, which was found to be statistically significant. Regular consumption of medication was found to be high among the Diabetics, which was indicated by the score of 68.4%. The difference was found to be statistically significant. Menopausal status was found to be significant among diabetics. The prevalence was high among people who had regular menopause as compared to those who were in other stages of menopause, which was indicated by the p-value of <0.001.

Results showed a significant relationship between stress scores among Diabetics and Non-Diabetics, which was indicated by a p-value of <0.001 [Table/Fig-2].

The scores in [Table/Fig-3] indicates that among the different domains of family functioning, in the area of Problem solving Diabetics have better skills than Non-Diabetics. In the remaining areas like Communication, Affective Responsiveness, Affective Involvement and Behavioral Involvement, no significant relationship is seen.

Characteristics		Diabetic		Non diabetic		Total		p-value
		n	%	n	%	n	%	
Gender	Male	119	47.6	94	37.6	213	42.6	0.024
	Female	131	52.4	156	62.4	287	57.4	
Occupational status	Professional	18	7.2	28	11.2	46	9.2	0.004
	Semi professional	22	8.8	35	14.1	57	11.4	
	Business	90	36	57	22.9	147	29.5	
	Bank	3	1.2	12	4.4	15	2.8	
	Housewife	51	20.4	59	23.7	110	22	
	Unskilled	29	11.6	21	8.4	50	10	
	Other	37	14.8	38	15.3	75	15	
Education	Illiterate	4	1.6	0	0	4	0.8	0.004
	1 <sup>st</sup> -5 <sup>std</sup>	20	8	14	5.6	34	6.6	
	6 <sup>th</sup> -10 <sup>std</sup>	64	25.6	51	20.5	115	23	
	Pre-university	45	18	37	15	82	16.4	
	Graduation	85	34	86	34.4	171	34.3	
	PG/PhD	32	12.8	62	24.9	94	18.8	
Marital status	Married	234	93.6	226	90.4	460	92	0.023
	Single	5	2	17	6.8	22	4.4	
	Widow	11	4.4	7	2.8	18	3.6	
Religion	Hindu	171	68.4	157	62.8	328	65.6	0.36
	Muslim	33	13.2	35	14	68	13.6	
	Christian	46	18.4	58	23.2	104	20.8	
Domicile	Urban	144	57.6	158	63.2	302	60.4	0.34
	Semi Urban	24	9.6	17	6.8	41	8.2	
	Rural	82	32.8	75	30	157	31.4	
Type of the family	Joint	170	68	146	58.4	316	63.2	0.057
	Nuclear	80	32	103	41.2	183	36.6	
	Extended	0	0	1	0.4	1	0.2	
Family History	Yes	103	42	14	5.6	119	23.8	0.005
	No	145	58	236	94.4	381	76.2	
Menopause	Regular	199	79.6	234	54	434	46.8	0.01
	Pre	15	6	8	3.2	23	4.6	
	Peri	13	5.2	3	1.2	16	3.2	
	Post	23	9.2	5	2	28	5.6	

[Table/Fig-1]: Socio-Demographic status among Diabetics & Non-Diabetics

Group	n	Mean	SD	p- value
Diabetic	250	22.17	4.46	p<.001
Non-diabetic	250	16.92	5.8	

[Table/Fig-2]: Stress mean score among Diabetics & Non-Diabetics.

Characteristics	Group	n	Mean	SD	p-value
Problem solving	Diabetic	250	13.2	1.84	p<.001
	Non Diabetic	250	12.36	1.59	
Communication	Diabetic	250	17.26	1.72	p=0.197
	Non Diabetic	250	17.06	1.74	
Family Roles	Diabetic	250	25.11	1.86	p=.013
	Non Diabetic	250	25.56	2.11	
Affective Responsiveness	Diabetic	250	17.38	2.4	p=0.132
	Non Diabetic	250	17.08	1.96	
Affective involvement	Diabetic	250	20.64	2.47	p=0.202
	Non Diabetic	250	20.94	2.77	
Behavioral control	Diabetic	250	24.38	2.72	p=0.314
	Non Diabetic	250	24.62	2.7	
General functioning	Diabetic	250	28.49	2.98	p<.001
	Non Diabetic	250	26.56	2.81	

[Table/Fig-3]: Mean & S.D of family assessment device score among Diabetics & Non-Diabetics

FAD/PSS	r	p-value
General functioning Vs PSS	0.753	p<0.001
Problem Solving Vs PSS	0.627	p<0.001
Communication Vs PSS	0.438	p<0.001
Roles Vs PSS	0.079	- 0.077
Affective Involvement Vs PSS	0.669	p<0.001
Affective Response Vs PSS	0.553	p<0.001
Behaviour Control Vs PSS	0.632	p<0.001

[Table/Fig-4]: Correlation between domains of family assessment device & perceived stress scale among diabetics

[Table/Fig-4] state that all the domains of Family Assessment Devices, like General Functioning, Problem Solving, Communication, Affective Involvement, Affective Responsiveness, Behaviour Control were positively associated with Perceived Stress Scale (p<0.001). Except, Family Roles which involved current and changing roles and patterns of behaviour that facilitated family functioning, which is negatively associated with Perceived Stress Score.

## DISCUSSION

The present study revealed that Perceived Stress was found to be high among Diabetic subjects than among Non-Diabetics (p<0.001). Study conducted by Takihiro et al., supported the present study results and it proved the relationship between psycho-social factors and the glycaemic control of patients with Type 2 Diabetes [3]. In the present study, a significant association was found between Diabetes and Family history. Erasmus R et al., conducted a study on black African-Americans, which supported the data of a positive family history. [4] Diabetes was found to be more among urban population than rural population, which could be compared with the findings of the study which was conducted by Rayappa P et al., [5]. In the present study, it was found, that a majority of diabetic study population was females, but a study which was conducted by Siddartha et al., contradicted the findings of the present study, where a majority of the subjects were males [6]. From the present study, it was found that stress influenced the glycaemic levels of Diabetics. A similar study which was conducted by Riazi et al., supported our study by indicating that stress influenced glycaemic levels in different ways in diabetics [7]. Stress directly affects the blood glucose level by influencing the neuroendocrine systems [8,9]. Family played a vital role in lives of individuals. In our study, it was found that in different domains of family functioning, Non-Diabetics had found their families to be more supportive than Diabetics, in Family Roles, General Functioning and Problem Solving. A similar study done by Adetunji A et al., proved the same, when they found individual correlate positively with their blood glucose found that their families were supportive as compared to those who did not have family support. The present study indicated that stress and family support were positively correlated. As diabetes is a highly self-managed disease, stress along with lack of social and family support, can have a significant impact on self-management and outcome [10-13]. Our study showed that in the domains of family Problem Solving and Family Roles, mean score in Non-Diabetics was statistically significant as compared to that in Diabetics. This was supported by a similar study done, which showed that spousal support helped in dealing with condition of patients in a better way [14]. Communication domain of family functioning did not show any statistical significance, whereas a study done by David L et al., contradicted this by proving that communicating the risks of Diabetes to family members improved the management of Diabetes [15]. Results stated that all the domains of Family Assessment Devices, like general functioning, problem solving, communication, affective involvement, affective responsiveness, behaviour control were positively associated

with Perceived Stress Scale ( $p < 0.001$ ). However, Family Roles showed a negative correlation with stress levels. This could be due to current or changing roles and patterns of behaviour that had facilitated family functioning especially, those that met basic needs, that designated responsibilities for household tasks were found to be very demanding and they increased the stress levels. A similar study done by Pierce M et al., [16] supported our finding that the process of diabetes management could be so demanding, that the subject could experience anger, frustration and discouragement without family support. A Diabetes-related conflict may occur in course of time with loved ones and relationships with health care providers may become strained. The risk of depression can be high [17].

## CONCLUSION

Our present study reported that Perceived Stress was an important aspect which had to be taken care of in the management of Type 2 Diabetes Mellitus, because it affected the glycaemic levels of Type 2 diabetic individuals. Family plays a valuable role in an individual's life and stress does influence the family functioning of subjects. Involving family members as a part of Diabetes Management plays a major role. Positive interpersonal relationships help in managing diabetes in a better way. Stress management technique should be included in diabetes education programme.

A psychosocial approach will help in designing a psycho-social model which will provide the clinicians an insight into consistent, practical approaches for assessing and treating Diabetic individuals, and their families, which include psychological and social dimensions. The total sample size was a limitation in our study, but as few correlational studies have been done on stress and family functioning in Type 2 Diabetes, this study provided the preliminary data for further studies.

## REFERENCES

- [1] Marks DF, Murray M, Evans BE., Willig C, Woodall CM. Health Psychology: Theory, Research and Practice, 2<sup>nd</sup> edn. London: 2006.

- [2] Priti Chandra. Psychological Aspects of Diabetes; *Int. J. Diab. Dev. Countries.* 1997; 17 :111-12
- [3] Riazi A, Pickup J, Bradley C. Daily stress and glycaemic control in diabetes: individual differences in magnitude, direction, and timing of stress-reactivity; *Diabetes Res Clin Pract.* 2004; 66: 237-44.
- [4] Takehiro N, Chihiro M, Sunao M, Koich I, Hiroaki Y, Keisuke K, et al. Relation between psychosocial variables and the glycaemic control of patients with type 2 diabetes: A cross-sectional and prospective study. *Bio Psycho Social Medicine.* 2009; 3:4.
- [5] Erasmus R, Blanco B, Okesina A, Mesa J, Gqweta Z, Matsha T; Importance of family history in type 2 black South African diabetic patients. *Postgrad Med J.* 2001;77:323-25.
- [6] Rayappa P, Raju K, Kapur A, Bjork S, Sylvest C, Dilip K. The impact of socio-economic factors on Diabetes care; *Int. J. Diab. Dev. Countries.* 1999; 19.
- [7] Siddhartha, Pooja M, Suchetha K, Sampath K, Madhu L. An epidemiology of prevalence of Type 2 Diabetes among the adult residents in Dakshina Kannada district; *Research Journal of Pharmaceutical, Biological and Chemical Sciences.* 2010 1 (586).
- [8] Surwit R, Van T, Zucker N. Stress management improves long-term glycemic control in type 2 diabetes; *Diabetes Care.* 2002; 25: 30-34.
- [9] Karlsen B, Idsoe T, Dirdal I, Rokne Hanestad B, Bru E. Effect of a group-based counseling programme on diabetes-related stress, coping, psychological well-being and metabolic control in adults with type 1 or type 2 diabetes; *Patient Educ Couns.* 2004; 53: 299-308.
- [10] Konen J, Summerson J, Dignan M. Family function, stress and locus of control: relationships to glycaemia in adults with diabetes mellitus; *Arch Fam Med.* 1993; 2: 393-402.
- [11] Ciechanowski P, Katon W, Russo J, Hirsch I. The relationship of depressive symptoms to symptom reporting, self-care and glucose control in diabetes; *Gen Hosp Psychiatry.* 2003; 25: 246-52.
- [12] Paschalides C, Wearden A, Dunkerley R, Bundy C, Davies R, Dickens C. The associations of anxiety, depression and personal illness representations with glycaemic control and health-related quality of life in patients with type 2 diabetes mellitus; *J Psychosom Res.* 2004; 57: 557-64.
- [13] Mckellar J, Humphreys K, Piette J. Depression increases diabetes symptoms by complicating patients' self-care adherence; *Diabetes Educ.* 2004; 30: 485-92.
- [14] Sultan S, Heurtier-Hartemann A. Coping and distress as predictors of glycaemic control in diabetes. *J Health Psychol.* 2001; 6: 731-39.
- [15] Elizabeth A. Beverly, Linda A. The role of collective efficacy in exercise adherence: a qualitative study of spousal support and Type 2 diabetes management; *Health Education Research.* 2010; 25 (2): 211-23.
- [16] Pierce M, Hayworth J, Warburton F, Keen H, Bradley C. Diabetes mellitus in the family perceptions of offspring's risk; *Diabetes Med.* 1999; 16: 431-36.
- [17] David L, Hannah M, Bernadette O. Will People With Type 2 Diabetes Speak to Family Members About Health Risk? *Diabetes Care.* 2009; 32: 251-23.

### PARTICULARS OF CONTRIBUTORS:

1. Senior Lecturer, Department of Humanities, K.S. Hegde Medical Academy, Nitte University, Mangalore, Karnataka, India.
2. Professor and Head, Department of Psychiatry, K.S. Hegde Medical Academy, Nitte University, Mangalore, Karnataka, India.
3. Senior Lecturer, Department of Humanities, K.S. Hegde Medical Academy, Nitte University, Mangalore, Karnataka, India.

### NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Bhagyashree Bhandary,  
Senior Lecturer, Department of Humanities & Social Science,  
K.S. Hegde Medical Academy, Nitte University and Nagar, P.O. Deralakatte- 575018, India.  
E-mail: bhags71@hotmail.com

FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Aug 20, 2013**  
Date of Peer Review: **Sep 27, 2013**  
Date of Acceptance: **Oct 27, 2013**  
Date of Publishing: **Dec 15, 2013**