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Association Between Glycemic Control and Quality of Life Among Patients with Type 2 Diabetes Mellitus Attending a Tertiary Care Center in South India

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ABSTRACT

Introduction: The prevalence of diabetes mellitus is increasing at alarming proportions worldwide. The increased life span of people with type 2 diabetes mellitus resulted in complications due to poor glycemic control that harms these patients' overall quality of life. The objective of the present study was to find out the association between glycemic control and the quality of life of patients with type 2 diabetes mellitus.

Methodology: Quantitative approach was adopted for the present study and it was conducted among 140 patients with type 2 diabetes mellitus who had attended the diabetic clinic of a tertiary care center in South India. Samples were selected consecutively and the data were collected using a semi-structured interview schedule. Quality of life (QoL) was assessed using SF- 36 quality of life questionnaire and glycemic control was estimated by HbA_1C (Glycosylated hemoglobin) level at baseline and after 6 months.

Results: The present study revealed that as HbA1c decreases, the quality of life increases. There was a highly significant correlation between HbA1c reduction and improvement in quality of life ($p = 0.0001$).

Conclusion: Patients with poor glycemic control had lower quality of life and tight glycemic control is necessary to ensure the quality of life of these patients.

Keywords: Glycemic control, Quality of life, Type 2 diabetes mellitus

INTRODUCTION

A worldwide epidemic, type 2 diabetes has an impact on all aspects of diabetics' lives. Diabetes affects 1 in 11 persons (20 to 79 years old) worldwide. This terrifying illness affects nearly 463 million people globally. 79% of them reside in low- and middle-income nations [1]. The health of people, cultures, and economies is all impacted by diabetes. Since type 2 diabetes mellitus is a chronic condition, it significantly impacts morbidity, mortality, and quality of life[2]. Due to micro and macrovascular problems brought on by inadequate glycemic management, type 2 diabetes mellitus is a progressive condition that lowers patients' quality of life [3].

Patients with diabetes in Asia are more likely to experience long-term problems [4]. Diabetes that is not properly controlled might cause serious complications and early mortality. Diabetes imposes a heavy financial and human cost, accounting for 10% of all medical spending worldwide[1].

Poor quality of life (QoL) results in decreased self-care, which in turn worsens glycemic control and raises the risk of complications, making QoL a significant factor in diabetes management [5]. The

estimation of glycosylated hemoglobin (HbA1C) is the most crucial method for determining how well diabetes is controlled. Patients' QoL can be improved by appropriately managing their blood sugar levels since they are less physically constrained to engage in daily activities. Maintaining the quality of life while controlling health care expenses requires glycemic control.

HbA_1C is an index of diabetes control and the relationship between glycemic control and QoL is unclear. Therefore, the investigator aims to find out the association between glycemic control and QoL.

MATERIALS AND METHODS

The study was started after obtaining clearance from Institutional Ethics Committee. A quantitative research approach was used for the study. Data were collected from 140 Type 2 diabetes mellitus patients who had attended the diabetic clinic of a tertiary care center in South Kerala at two points - baseline and at 6 months. Patients who had type 2 diabetes mellitus for at least 6 months, aged between 25 - 65 years were included. Samples were selected consecutively. Health-related Quality of Life was measured using SF-36. It includes eight individual subscales – Physical functioning (PF), Role Physical (RP), Bodily Pain (BP), General Health (GH), Vitality (VT), Social Functioning (SF), Role Emotional (RE), and Mental Health (MH), one additional item (Change in health status since last one year) and two summing scales - Physical Component Summary (PCS) and Mental Component Summary (MCS). PCS gives the summary of Physical Functioning (PF), Role Physical (RP), Bodily Pain (BP), and General Health (GH). MCS consists of Vitality (VT), Social Functioning (SF), Role Emotional (RE), and Mental Health (MH). The scores of SF - 36 range between 0 – 100. A higher SF- 36 score indicates better functioning. The glycemic control of participants was assessed by measuring HbA_1C level. During these 6 months, the participants were given education on self-management of diabetes monthly during their routine follow-ups.

Data were analyzed using appropriate descriptive and inferential statistics. The correlation between glycemic control and QoL was computed by the Spearman correlation coefficient. The regression model was used to evaluate the impact of change in HbA_1C on the SF- 36 score.

RESULTS

Out of the 140 participants studied, the mean age of the participants was 56 ± 11.6 years. Males and females constituted 50% each. Concerning education, 10.7% of participants had primary education, and 48.6 % had intermediate education. 68.7% of participants belonged to nuclear families. 57.1%had a family history of diabetes mellitus. The mean HbA1C at baseline was 8.27 ± 1.5% and that at 6 months was 7.90 ± 1.3%.

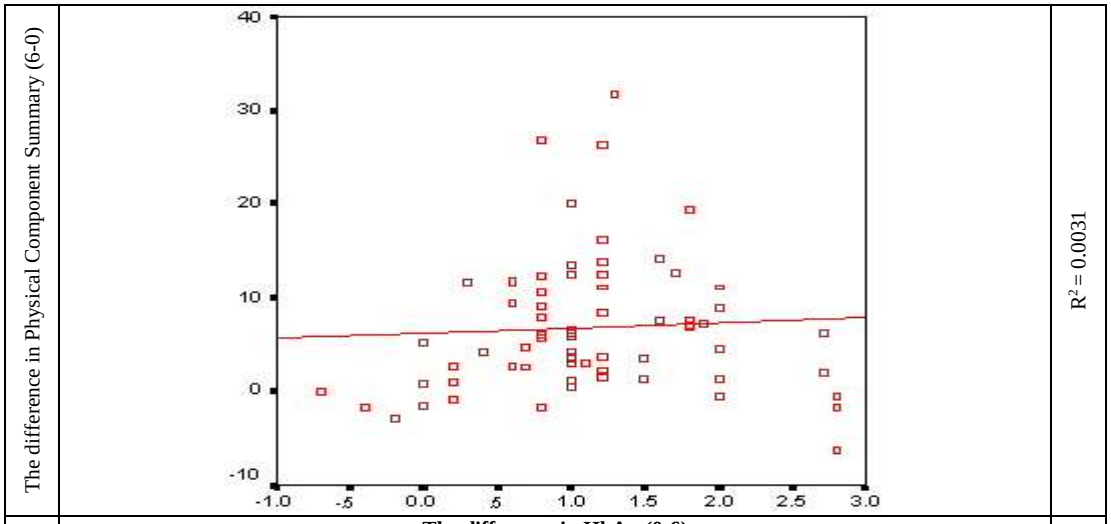
With regards to QoL, the overall QoL was impaired in all subscales at baseline. The mean Physical Component Summary (PCS) of participants was increased in all subscales of SF - 36 was found at 40.76 ± 8.72 and the mean Mental Component Summary (MCS) was 36.19 ± 11.11. An overall SF- 36 score increase was found at the end of 6 months. PCS score at the end of 6 months was 43.29 ± 96 and that MCS score was 40.28 ± 14.35. Spearman's correlation coefficient was computed to assess the correlation between the HbA1c level and Quality of life. It is clear from *table 1* that there was a highly significant correlation between a reduction in HbA1C level and an improvement in Quality of Life. As the HbA1c level decreases, the quality of life increases.

Table 1: Correlation between HbA1c and QoL

Correlation	r	p
Reduction in HbA1c (0-6) vs. PF (6-0)	0.55	0.0001*
Reduction in HbA1c (0-6) vs. RP (6-0)	0.56	0.0001*
Reduction in HbA1c (0-6) vs. BP (6-0)	0.52	0.0001*
Reduction in HbA1c (0-6) vs. GH (6-0)	0.63	0.0001*
Reduction in HbA1c (0-6) vs. VT (6-0)	0.57	0.0001*
Reduction in HbA1c (0-6) vs. SF (6-0)	0.51	0.0001*
Reduction in HbA1c (0-6) vs. RE (6-0)	0.54	0.0001*
Reduction in HbA1c (0-6) vs. MH (6-0)	0.55	0.0001*
Reduction in HbA1c (0-6) vs. PCS (6-0)	0.56	0.0001*
Reduction in HbA1c (0-6) vs. MCS (6-0)	0.60	0.0001*

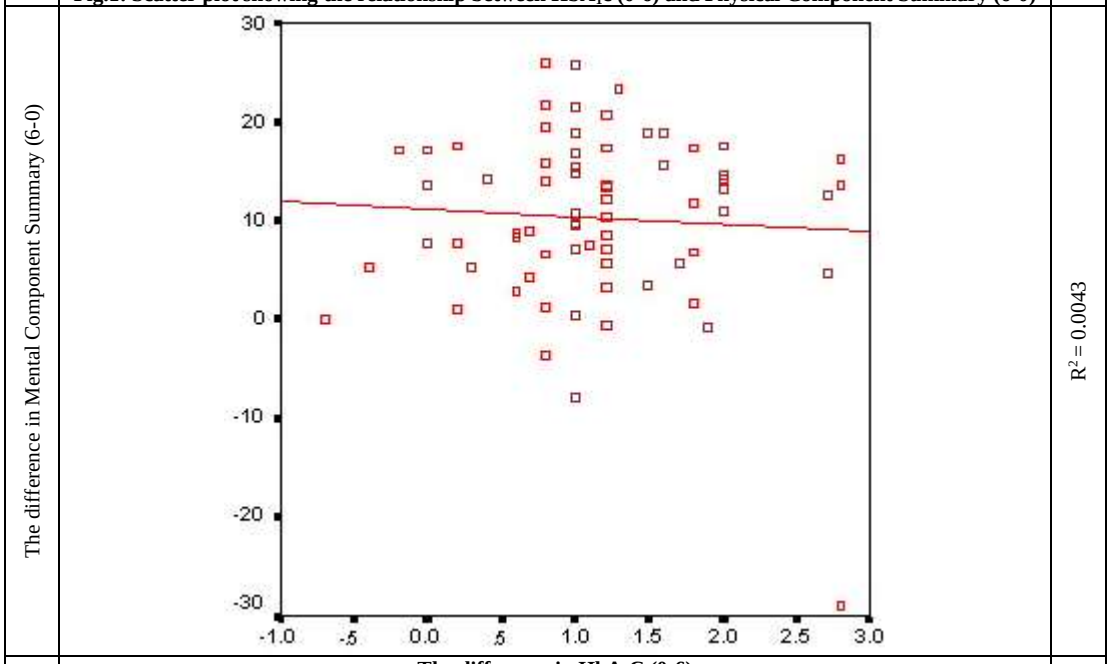
***Significant ($p < 0.05$)**

These correlations were shown in the following figures (Fig: 1-2). R^2 is the total prediction of the dependent variable (predicted) by the independent variable (predictor).



The difference in HbA_{1c} (0-6)

Fig.1: Scatter plot showing the relationship between HbA_{1c} (0-6) and Physical Component Summary (6-0)



The difference in HbA_1C (0-6)

Fig.2: Scatter plot showing the relationship between HbA_{1c} (0-6) and Mental Component Summary (6-0)

DISCUSSION

The present study revealed that as HbA_1c decreases, the quality of life increases. There was a highly significant correlation between HbA_1c reduction and improvement in quality of life ($p = 0.0001$).

The study result was supported by a cohort study on patients with type 2 diabetes to assess the association between QoL and change in HbA_1c over 1 year revealed that average MCS increased by 8.46% and PCS decreased by 2.24% and a 5% decrease in HbA1c was associated with a 1% increase in MCS. But no association between change in HbA1c and PCS was observed [6].

A study in Kerala also showed that there was a correlation between a reduction in capillary blood glucose level and an improvement in the quality-of-life scores ($r = -0.955$) [7].

Another study to assess the determinants of glycemic control and quality of life in

diabetic patients revealed that glycemic control was negatively influenced by nonadherence to drug treatment and diabetes quality of life was negatively affected by poor glycemic control [8].

The finding was similar to those reported from a prospective study to evaluate the impact of initiation of insulin therapy, metabolic control, and structured patient education on the diabetic-related quality of life done in Germany, that diabetes-related quality of life improved significantly as the metabolic control improved (r = - 0.32, p=0.007)[9].

The present study's finding was contrary to the finding of earlier researchers, which assessed the effect of intensive glucose control therapy on the quality of life of elderly people. The researchers found out that intensive glucose control does not affect the QoL of diabetic patients[10].

CONCLUSION

Diabetes has been referred to as an emerging epidemic health problem. Poorly controlled diabetes mellitus affects the end organs and complications have a tremendous impact on the quality of life and health costs of the individual and at a large society.

Declaration by Authors

Ethical Approval: Approved

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Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. International Diabetes Federation. (2020). IDF Diabetes atlas update. 9th edition. Brussels, Belgium.
2. Hoskote, S.S., & Joshi, S.R. (2008). Are Indians Destined to be Diabetic? *Journal of Physicians of India, 56,* 225-226.
3. Mohan, V., Shah, S., & Saboo, B. (2013, January). Current glycemic status and diabetes-related complications among type 2 diabetes patients in India: data from A1chieve study. *J Assoc Physicians India,61(1),*12-15.
4. Unwin, N., Whiting, D., Gan, D., Jacqmain, O.,& Ghyoot, G.(Eds). (2009).IDF Diabetes Atlas (4th Ed). Brussels: International Diabetes Federation.
5. Garratt, A.M., Schmidt, L., & Fitzpatrick, R. (2002). Patient assessed health outcome measures for diabetes: A systematic review. *Diabetes Med*, 19, 1 - 11.
6. Lau, C., Qureshi, A.K., & Scott, S.G. (2004). Association between glycemic control and quality of life in diabetes mellitus. *J Postgrad Med, 50,* 189-194.
7. Adepu, R, Rasheed, A., & Nagavi, B.G. (2007). Effect of patient counseling on quality of life in type 2 diabetes mellitus patients in two selected South Indian Community Pharmacies. *Indian J Pharm Sci, 69,* 519-24.
8. Souza, R.A.P., Correr, C.J., Melchiors, A.C., Sanches, A.C.C., Wiens,A.,& Pontarolo,R. (2011).Determinants of glycemic control and quality of life in type 2 diabetic patients. *Latin American Journal of Pharmacy*, 30(50), 860-867.
9. Braun, A., Samann, A., Kubiak, T., Zieschang, T., Kloos, C., & Muller, U.A. (2008). Effects of metabolic control, patient education, and initiation of insulin therapy on the quality of life of patients with type 2 diabetes mellitus. *Patient Education and Counseling*, 73, 50-59.
10. Zhang, Q., Zhang, N., Hu, H.L., He, Y., Chen, M.W., Wang, X.Y., & et al. (2011, Jun). Effect of intensive blood glucose control on the quality of life in elderly patients with type 2 diabetes in Anhui Province. *Chin Med J (Engl)*, 124(11), 1616 - 1622.

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