

A Study to Assess the Effectiveness of Yoga on HbA1C Level among Patients with Type 2 Diabetes Mellitus

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ABSTRACT

Yoga has been shown to be beneficial in reducing the HbA1c level in some but not all studies. Hence the benefits of yoga on reducing the level of HbA1c clients remains inconclusive. The current study aims to evaluate the effect of yoga on HbA1c level among patients with type 2 diabetes mellitus. A quantitative with experimental one group pretest, posttest was adopted for the present study. 30 patients diagnosed as type 2 diabetes mellitus were recruited using purposive sampling technique and were assigned into an experimental group. A self-structured questionnaire method was adopted to collect the demographic information. Followed by that, yoga was practiced after the pretest to the experimental group. The result revealed that there was a significant difference identified in pretest and posttest level of HbA1c. The calculated paired 't' value of $t = 10.610$ was found to be statistically significant at $p < 0.001$ level. This clearly shows that there was significant difference in the level of the HbA1c between the pretest and posttest which clearly infers that administration of yoga on HbA1c among patients in type 2 diabetes mellitus was found to be effective in reducing the level of HbA1c in the post test.

KEYWORDS: Type II Diabetes Mellitus, yoga, HbA1c level

INTRODUCTION

Diabetes is one of the leading causes of mortality throughout the world. Type 2 diabetes mellitus is one of the most frequently encountered metabolic syndrome worldwide. Type 2 diabetes is a chronic disease characterized by a lack of insulin or the ineffective use of insulin by the human body, often associated with lifestyle factors such as a lack of physical activity and obesity. The most recent meta-analysis showed that the overall prevalence has been increasing among inland residents in china. and it increased rapidly with age. Therefore, the world health organization and American college of sports medicine (ACSM) suggests that type 2 diabetes mellitus patients should maintain at least 150 minutes of moderate intensity exercise or 90 minutes of vigorous intensity exercise every week as part of glycemic control. The consequences of long-term hyperglycemic level include neurological or vascular complications which may result in amputation, retinopathy, kidney failure, or other severe complications. Diabetes mellitus, commonly known

as diabetes, is a group of metabolic disorders characterized by a high blood sugar level over a prolonged period of time. Symptoms often include frequent urination, increased thirst and increased appetite.

Yoga asana (postures) and pranayama (breath control) have recently become very popular, and the role of yoga in several chronic diseases, such as hypertension, asthma, chronic obstructive pulmonary disease and diabetes, has been studied. Several trails have shown that yoga can reduce fasting blood glucose (FBG) and glycosylated hemoglobin A1C (HbA1c), as well as improve the lipid levels and quality of life of type 2 diabetes mellitus patients. Thus, in the present study, we carried out a meta-analysis of the effectiveness of yoga in patients with type 2 diabetes mellitus.

MATERIAL AND METHODS:

The study used was quantitative research approach and true experimental research design with the

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sample size 30 who has type 2 diabetes mellitus who were selected by the purposive sampling technique and who were satisfied with inclusion criteria. The inclusion criteria were the patients who are willing to participate in the study, the patients who can understand Tamil/English, The type 2 diabetes patients who are admitted in saveetha medical college and hospital, The patients who are in the age of 45 or above and the exclusion criteria is The patients who had normal HbA1C level, The patients who are uncooperative, the patients who are not able to do yoga, the type 2 diabetes patients with coronary artery disease. The data collection was done by prior

permission from the hospital authority and ethical clearance was obtained from the institution (SIMATS). The purpose of the study was explained to the samples and written informed consent was obtained from them. The demographic data were collected using a semi structured interview questionnaire and then in biochemical changes HbA1C level is monitored after the practice of yoga. The data were analyzed using descriptive and inferential statistics. The sample characteristics were described using frequency and percentage. chi square was used to associate the posttest level of biochemical changes among selected demographic variables.

RESULT AND DISCUSSION:

Section A: Demographic characteristics

In the present study, most of the patients with type 2 diabetes mellitus, 17(56.7%) were aged above 50 years, 15(50%) were male and female respectively, 22(73.3%) were Hindus, 10(33.3%) had higher secondary education, 20(66.7%) were unemployed, 16(53.3%) had monthly income of 5000 – 10000, 30(100%) were married, 29(96.7%) were non-vegetarian, 21(70%) belonged to middle class, 13(43.3%) involved in limited activity, 15(50%) had diabetes for 3 – 4 years, 23(76.7%) were interested in yoga, 30(100%) had history of taking insulin, 19(63.3%) were aware of yoga, 18(60%) had irregular diet plan follow up, 30(100%) had type 2 diabetes mellitus, 16(53.4%) had history of type 2 diabetes mellitus for 3 – 5 years, 18(60%) had family history of type 2 diabetes mellitus, 30(100%) were under regular treatment, 22(73.3%) were not doing exercise regularly, 23(76.7%) were aware of HbA1c, 21(70%) were known about the level of their HbA1c and 25(83.3%) were following diabetic diet.

Section B: Assessment of level of HbA1c among patients with type 2 diabetes mellitus.

In the present study shows that among patients with type 2 diabetes mellitus, 28(93.3%) had diabetes and 2(6.7%) had prediabetes in the pretest whereas in the posttest 22(73.3%) had diabetes, 5(16.7%) had prediabetes and 3(10%) were normal. (Table 1; figure 1)

Table 1: Frequency and percentage distribution of pretest and posttest level of HbA1c among patients with type 2 diabetes mellitus.

Level of HbA1c	Pretest		Post Test	
	Frequency	Percentage	Frequency	Percentage
Normal (<5.7%)	-	-	3	10.0
Prediabetes (5.7% - 6.4%)	2	6.7	5	16.7
Diabetes (\geq 6.5%)	28	93.3	22	73.3

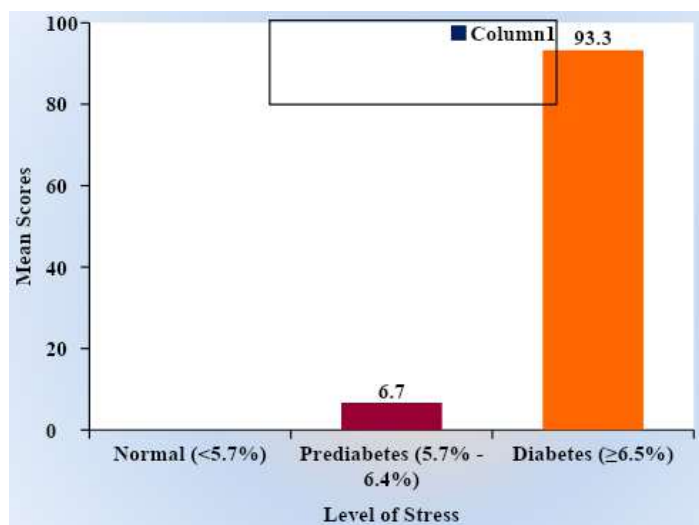


Figure 1: Percentage distribution of pretest and posttest level of HbA1c among patients with type 2 diabetes mellitus

Section C: Effectiveness of Yoga on HbA1c among patients with type 2 diabetes mellitus.

The present study findings are supported by a comparative study conducted by Uttio Gupta et al (2020) among 81 patients with Type 2 diabetes mellitus aiming in investigating the HbA1C level among patients. The HbA1C test was performed in this study. At the end of the study, it was identified that there was significant reduction in HbA1C level among type 2 diabetes mellitus patients.

The present study findings are supported by a comparative study conducted by satarupa dash (2014) among 60 patients with type 2 diabetes mellitus aiming to investigate the HbA1c, FBG and PPBG level among patients. The HbA1c, FBG and PPBG test was performed in this study. At the end of the study, it was identified that there was significant reduction in HbA1c, FBG and PPBG level among type 2 diabetes mellitus patients.

Table 2: Comparison of pretest and posttest level of HbA1c among patients with type 2 diabetes mellitus.

n = 30				
Test	Mean	S.D	Mean Difference	Paired 't' test Value
Pretest	10.61	2.72	2.01	t = 10.610 p=0.0001, S***
Post Test	8.60	2.37		

***p<0.001, S – Significant

Table 4 depicts that the mean score of HbA1c among patients with type 2 diabetes mellitus was 10.61 ± 2.72 and the posttest mean score was 8.60 ± 2.37 . The mean difference score was 2.01. The calculated paired 't' test value of $t = 10.610$ was found to be statistically significant at $p < 0.001$ level. This clearly shows that there was significant difference in the level of the HbA1c between the pretest and posttest which clearly infers that administration of yoga on HbA1c among patients in type 2 diabetes mellitus was found to be effective in reducing the level of HbA1c in the post test.

SECTION D: ASSOCIATION OF LEVEL OF HBA1C WITH SELECTED DEMOGRAPHIC VARIABLES.

In this present study the demographic variables religion ($\chi^2=6.316$, $p=0.043$) and doing exercise regularly ($\chi^2=6.316$, $p=0.043$) had statistically significant association with posttest level of HbA1c among patients with type 2 diabetes mellitus at $p < 0.05$ level respectively and the other demographic variables had not shown statistically significant association with posttest level of HbA1c among patients with type 2 diabetes mellitus.

CONCLUSION

Based on the findings of the current study, it was evident that there was significant effect yoga therapy reduces the levels of HbA1c among patients with type 2 diabetes mellitus. Therefore, yoga therapy can be used to reduce HbA1c level among type 2 diabetes mellitus which is a highly feasible method to treat type 2 diabetes mellitus as a part of nursing care.

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REFERENCES

- [1] International journals of medical science and public health, self-care management of diabetes, 2017.
- [2] Brunner, L. S. (2010). Brunner & Suddarth's textbook of medical-surgical nursing (Vol. 1). Lippincott Williams & Wilkins.
- [3] Zargar AH, Wani AA, Lawny BA, Masoodi SR, Wani AI, et al. (2008) Prevalence of diabetes mellitus and other abnormalities of glucose tolerance in young adults aged 20-40 years in North India (Kashmir Valley).
- [4] American Diabetes Association, Lifestyle Management: Standards of medical care in diabetes-2016.
- [5] Journal of family medicine and primary care, Prevention and complications of type 2 diabetes mellitus.
- [6] Diabetes Res ClinPract 82: 276-281. <http://www.idf.org/diabetesatlas/update-2014>.
- [7] Thent ZC, Das S, Henry LJ (2013) Role of exercise in the management of diabetes mellitus: the global scenario. PLoS One 8: e80436. amachandran A, Ma RC, Snehalatha C (2010) Diabetes in Asia. Lancet 375: 408-418.
- [8] WHO/NCD/NCS/99.2, Definition, diagnosis and classification of diabetes mellitus and its complications. Report of a WHO Consultation, World Health Organization, Geneva, 1999.
- [9] Malhotra, V. et al., Effect of yoga asanas on nerve conduction in type 2 diabetes. Indian J. Physiol. Pharmacol., 2002, 46, 298–306.
- [10] Malhotra, V., Singh, S., Tandon, O. P. and Sharma, S. B., The beneficial effect of yoga in

- diabetes. *Nepal Med. Coll. J.*, 2005,7(2), 145–147.
- [11] Karthikeyan, J., Effect of yoga and aerobic training on biochemical variables in middle aged diabetic patients. *Int. J. Sci. Cult.Sport*, 2015, 3(2), 13–20.
- [12] AH, Wani AA, Laway BA, Masoodi SR, Wani AI, et al. (2008) Prevalence of diabetes mellitus and other abnormalities of glucose tolerance in young adults aged 20-40 years in North India (Kashmir Valley).
- [13] Diabetes Res ClinPract82:27281. <http://www.idf.org/diabetesatlas/update-2014>.
- [14] Ramachandran A, Ma RC, Snehalatha C (2010) Diabetes in Asia. *Lancet* 375: 408-418.
- [15] Sridhar GR, Madhu K (2002) Psychosocial aspects of diabetes. In Ahuja MMS, Tripathy BB, Moses SGP et al. (eds). *RSSDI, Textbook of Diabetes*. Research Society for the Study of Diabetes in India, Hyderabad, 737-755.
- [16] US Department of Health and Human Services (1996) *Physical Activity and Health: A Report of the Surgeon General*. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion.
- [17] Catherine, H. Y., Parsons, J. A., Mamdani, M., Lebovic, G., Hall, S., Newton, D., ... & Straus, S. E. (2014). A web-based intervention to support self-management of patients with type 2 diabetes mellitus: effect on self-efficacy, self-care and diabetes distress.
- [18] Jalil, A., Zakar, R., Zakar, M. Z., & Fischer, F. (2017). Patient satisfaction with doctor-patient interactions: a mixed methods study among diabetes mellitus patients in Pakistan.
- [19] Cho NH, Shaw JE, Karuranga S, Huang Y, da Rocha Fernandes JD, Ohlrogge AW, et al. *IDF diabetes atlas: Global estimates of diabetes prevalence for 2017 and projections for 2045*.
- [20] Gopichandran V, Lyndon S, Angel MK, Manayalil BP, Blessy KR, Alex RG, et al. Diabetes self-care activities: A community-based survey in urban southern India. Khunti K, Ceriello A, Cos X, De Block C. Achievement of guideline targets for blood pressure, lipid, and glycaemic control in type 2 diabetes: A meta-analysis.
- [21] Odgers-Jewell K, Ball LE, Kelly JT, Isenring EA, Reidlinger DP, Thomas R. Effectiveness of group-based self-management education for individuals with Type 2 diabetes: A systematic review with meta-analyses and meta-regression Huang XL, Pan JH, Chen D, Chen J, Chen F, Hu TT. Efficacy of lifestyle interventions in patients with type 2 diabetes: A systematic review and meta-analysis.
- [22] Sohal T, Sohal P, King-Shier KM, Khan NA. Barriers and facilitators for type-2 diabetes management in South Asians
- [23] Raveendran AV, Deshpandae A, Joshi SR. Therapeutic role of yoga in type 2 diabetes. Colberg SR, Sigal RJ, Yardley JE, Riddell MC, Dunstan DW, Dempsey PC, et al. Physical activity/exercise and diabetes: A position statement of the American diabetes association
- [24] Gupta U, Gupta Y, Jose D, Mani K, Jyotsna VP, Sharma G, et al. Effectiveness of a video-based lifestyle education program compared to usual care in improving HbA1c and other metabolic parameters in individuals with type 2 diabetes: An open-label parallel arm randomized control trial (RCT)
- [25] Goyal A, Gupta Y, Kalaivani M, Sankar MJ, Kachhawa G, Bhatla N, et al. Concordance of glycaemic and cardiometabolic traits between Indian women with history of gestational diabetes mellitus and their spouses: An opportunity to target the household.
- [26] Cui J, Yan JH, Yan LM, Pan L, Le JJ, Guo YZ. Effects of yoga in adults with type 2 diabetes mellitus: A meta-analysis. J Diabetes Investig Thind H, Lantini R, Balletto BL, Donahue ML, Blotcher ES, Bock BC, Scott-Sheldon LA. J. The effects of yoga among adults with type 2 diabetes.
- [27] Jayawardena R, Ranasinghe P, Chathuranga T, Atapattu PM, Misra A. The benefits of yoga practice compared to physical exercise in the management of type 2 Diabetes Mellitus: A systematic review and meta-analysis. R, Usharani MR, Rao AR, Chaku R, Kulkarni R, Nagendra HR. Efficacy of yoga-based life style modification program on medication score and lipid profile in type 2 diabetes – a randomized control study.
- [28] Vaishali K, Kumar KV, Adhikari P, UnniKrishnan B. Effects of yoga-based program on glycosylated hemoglobin level serum lipid profile in community dwelling

- elderly subjects with chronic type 2 diabetes mellitus-a randomized controlled trial.
- [29] Uttio Gupta, Yashdeep, effectiveness of yoga based exercise program compared to usual care, in improving HbA1C individual with type 2 diabetes mellitus, 2020.
- [30] E, Recharlachenchu, Karthik, self care practices among type 2 diabetes in rural areas, 2020
- [31] Epstein L A, Treatment of chronic insomnia with yoga among young at institute of swine burn University, 2019.
- [32] Won JS, Effectiveness of yoga on sleep vital signs and fatigue at garden country hospital and nursing home, 2008.
- [33] E. M. Mikhael, Effectiveness of self-management educational programs for type 2 diabetes patients in Middle East countries, 2020.

