

Impact of Yogic Interventional Therapies on Risk Factors in Individuals Diagnosed with Type II DM: A Systematic Review

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ABSTRACT

The incidence of type 2 diabetes is on the rise due to sedentary lifestyles, physical inactivity, and advancing age, with India being the world's capital of diabetes. It is imperative to do a thorough evaluation of the effects of long and short term yogic practice on cases of diabetes mellitus type II. The intent of this review is to assess how yoga interventions affect risk factors among individuals with type II diabetes mellitus. The authors of this paper conducted a thorough search for pertinent research studies. The researcher chose 18 papers for critical narrative review from a total of 60 studies that were assessed from open-access electronic databases. The primary focus of the selection was on (i) articles that were published in English-language, double-blind, peer-reviewed in national and international journals between 2015 and 2024. (ii) Covering cases of Type II Diabetes Mellitus, Yogic Exercises, and Curative Therapies; (iii) conceptual, research-oriented quantitative and qualitative designs; and (iv) longitudinal control investigations. The treatise was narrowed down to 18 studies by systematically applying the exclusion criteria. Upon closer examination, it became evident that the majority of the studies examined the mental health, as well as the physiological and cognitive functioning, and overall well-being, of the general population. Studies on yoga, overall health, and stress reduction were conducted. Studies involving adult patients with Type II Diabetes mellitus and yoga-based interventional therapy are getting prominent. In conclusion, the current review suggests that yoga has a good effect on preventing measure in those who are overweight or obese which leads to Type II DM.. Overall, research indicates that engaging in the practice of yoga may lead to notable improvements in a number of parameters crucial to the management of diabetes mellitus, such as BMI, lipid levels, and glycaemic control. However, because of the methodological heterogeneity, the juvenile diabetes, kind of Yogic intervention, and the contexts used in the present study, the results are unlikely to be broadly generalised.

Key words: Type II DM, Yogic Interventional Therapies, Yoga Asanas, Glycaemic Control, prevention of Diabetes

INTRODUCTION

Diabetes is a complicated kind of metabolic syndrome characterised by an absolute or relative insulin shortage or inefficiency. The majority of people with type 2 diabetes are obese during the onset of the disease, and obesity is rapidly increasing as a global health risk. In addition to rising with age comes the incidence of type 2 diabetes, physical inactivity, and sedentary lifestyle. The problem is exacerbated by a significant genetic tendency, leading to the current epidemic of juvenile diabetes in children and adolescents. Any kind of physical activity seems challenging to a lot of overweight people who are not physically active, which frequently keeps fat people from starting and maintaining a particular type of physical activity. The ancient Indian science of yoga is a way of life that incorporates meditation, asanas (yoga postures), pranayamas (breathing exercises), and dietary adjustments along with specialised technique practice. Of all the yoga techniques, breathing exercises, or pranayamas, are easier for physically inactive people to conduct while sitting. Through neuroendocrine processes, yoga has demonstrated its effectiveness in reducing oxidative stress and improving the glycaemic state of diabetics. This study examined the impact of three months of yoga and pranayama practices on anthropometric variables such as weight, BMI, waist-hip ratio, and metabolic markers such as FBS, PPBS, Hb A1c, and lipid profile in patients with simple type 2 diabetes. The ancient Indian science of yoga is a way of life that incorporates meditation, asanas (yoga postures), pranayamas (breathing exercises), and dietary adjustments along with specialised technique practice. Of all the yoga techniques, breathing exercises, or pranayamas, are easier for physically inactive people to conduct while sitting. Through neuroendocrine processes, yoga has demonstrated its effectiveness in reducing oxidative stress and improving the glycaemic state of diabetics. This study examined the impact of three months of yoga and pranayama practices on anthropometric variables such as weight, BMI, waist-hip ratio, and metabolic markers such as FBS, PPBS, Hb A1c, and lipid profile in patients with simple type 2 diabetes. Furthermore, we looked into possible effects on daily doses of insulin. According to Iyengar (1995), the main objectives of yoga practice are the development of a strong, flexible body that is pain-free; the integration of the body, mind, and breath to produce structural, physiological, and psychological effects; and the creation of a balanced nervous

system that allows all physiological systems to function optimally with a clear and calm mind.

RESEARCH QUESTION

1. Is Yoga successful in improving Glycaemic Index of NIDDM.
2. Can Yoga be an effective complementary treatment for Type II DM.

METHODS

We browsed for original, scholarly articles reporting on Controlled Trials and Non Controlled trials of yoga in the management of diabetes in eight databases via EBSCO, Pub Med, Research Gate, Google Scholar, SSRN, PsyInfo, Science Direct etc which are OER and has free access. we conducted a manual search of our own records, the reference portions of current reviews on yoga and diabetes, and the citation sections of all identified articles. Included were original, controlled studies that assessed the impact of yoga and yoga-based interventions on blood pressure, lipid profiles, body weight or composition, glycaemic control and insulin resistance, or other relevant outcomes like oxidative stress, neuronal system function, cardiopulmonary function, mood and sleep disturbance, or medication use. Uncontrolled trials, cross-sectional studies, case series, case studies, and trials that were only published in abstract or dissertation form were all disqualified. Included were original, controlled studies that assessed the impact of yoga and yoga-based interventions on blood pressure, lipid profiles, body weight or composition, glycaemic control and insulin resistance, or other relevant outcomes like oxidative stress, neuronal system function, cardiopulmonary function, mood and sleep disturbance, or medication use. Uncontrolled trials, cross-sectional studies, case series, case studies, and trials that were only published in abstract or dissertation form were all disqualified. Articles that did not explicitly target people with diabetes, include yoga as the primary intervention component, examine yoga programs lasting at least two weeks, or present quantitative outcome data were also disregarded.

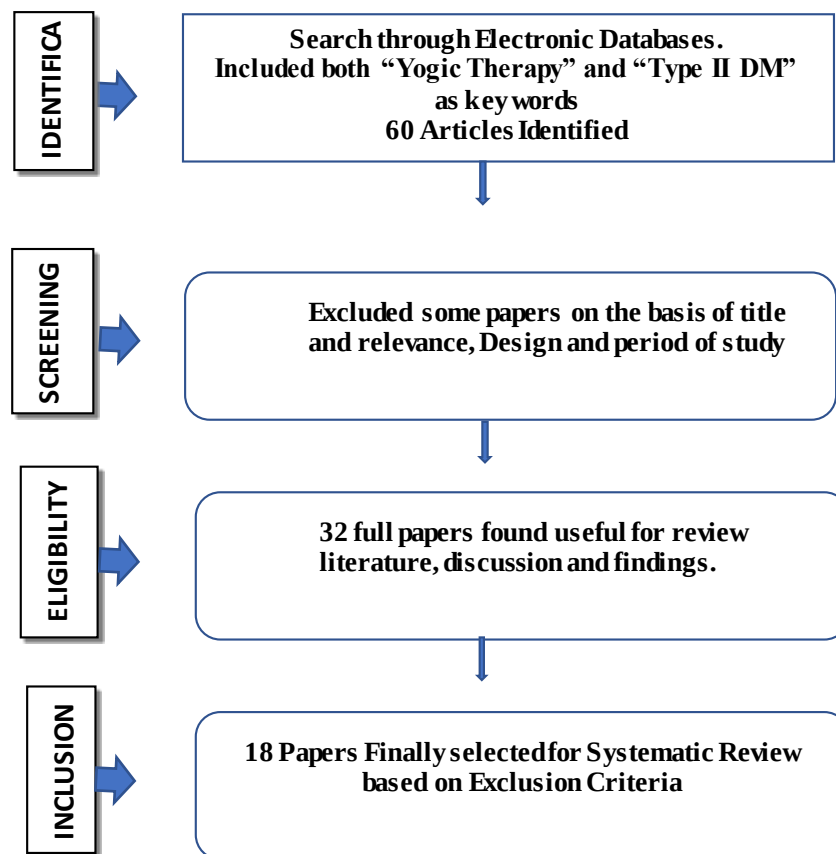


Fig.1 shows Flow diagram for the inclusion criteria of articles/papers for this study

One of two design categories—randomized controlled trials (RCTs) or nonrandomized controlled trials (NRCTs)—was applied to each qualifying study that was found. An active intervention group (yoga, for example) and one or more comparison groups are the minimum number of groups to which each participant in an RCT is randomly assigned. The experimental design and analytical approach of NRCTs are comparable to those of RCTs, but the assignment to a particular treatment is not done at random.

RESULTS

60 possibly eligible publications were found for further evaluation out of the 32 potentially relevant abstracts and citation indices that were scanned. We included 18 papers that satisfied our inclusion criteria and reported results from original research.

Table-1: Research reviewed including fundamental or key findings:—Here is the summary of the few research themes and the theoretical bases of each of the papers reviewed.

Author and Year of Publications	Treatment Duration	Sample Size Enrolled Retained	Study Design Randomised Trials (RT) Non Randomised Trials (NRT)	Yoga Intervention	Major Findings
Maricarmen Vizcaino (2014)	completed therapeutic yoga classes for 6 weeks, 3 times per week	10-10	10	Hatha yoga	No significant changes in glucose control or physiological stress were found; however, significant changes in perceived stress, state anxiety, and self-care behaviors were detected.
Nagarthna Raghuram et al (2020)	Yoga-based lifestyle intervention was introduced through 10-day non-residential camps	1292-896	NRT	Yoga-based lifestyle intervention in the management of diabetes	ResultsMean baseline <u>FP G level</u> was 133.1 (± 47.98) and the mean post intervention FPG reduced to 121.19 (± 40.56). There was a statistically significant decrease in FPG

Birdee, G. S. (2015).	12 weeks	48	RT Participants were randomized to a 12-week program of either; (1) a twice weekly Iyengar yoga, or (2) a twice-weekly program of standard exercise (SE)	A 2-arm randomized clinical trial comparing Iyengar yoga with a supervised walking program.	Yoga produced significant reductions in HbA1c
Mondal,et al.,(2018)	12 weeks yogic intervention	20	RT	yogic intervention	There was a significant ($P < 0.01$) decrease in fasting plasma glucose, postprandial blood sugar, total cholesterol, triglycerides, low-density lipoprotein
Singh,et.al.,(2015)	40days	20	NRT	Yoga asanas	The glycosylated haemoglobin decreased from 10.27 ± 0.5 to 8.68 ± 0.4 %. These findings suggest that yoga asanas have a beneficial effect on glycaemic control and

					lipid profile in mild to moderate Type 2 diabetes.
Kelly A McDermott, et al (2022)	08 weeks	41	RT	yoga classes or complete monitored walking 3–6 days	There were significant reductions in systolic and diastolic blood pressure, total cholesterol, anxiety, depression, negative affect and perceived stress in both the yoga intervention and walking control over the course of the study.
Ranil jayawardhena (2018)	08 weeks	842	NRT	Yoga and Physical Exercise	Yoga has beneficial effects on <u>glycaemic control</u>
Lana Skoro-Kondza, et al (2023)	12 weeks	59 ppl	NRT	Yoga and Physical Exercise	Yoga teachers felt that most participants were unsuitable for 'standard' yoga exercises because of limited flexibility,

					lack of basic fitness, co-morbidity, and lack of confidence. There was a small fall in HbA1c in the yoga group
Nisha Shantakumar et al (2015)	03 Months	65	RT	intervention with yoga for a period of 3 months	study group showed a decrease in total cholesterol, triglycerides and LDL, with an improvement in HDL.
Bock, B. C., et al (2018)	08 Weeks	45	RT		Decrease in the levels of BMI, Lipid profile, Glycemic Index and Improvement in Normal Blood Sugar Levels.

Yoga and DM2: Possible Underlying Mechanisms

Although the mechanisms underlying the apparent beneficial effects of yoga therapy on diabetes risk profiles are not yet well understood, mechanistic pathways are likely complex and interacting. First, yoga may lessen the negative impact of stress and promote multiple positive downstream effects on metabolic function, neuroendocrine status, and related inflammatory responses and, ultimately, reduce risk for CVD and other vascular complications, by enhancing well-being and reducing reactivity and activation of the HPA axis and the sympathoadrenal

system. For instance, recent controlled trials suggest even short term yoga training programs can reduce perceived stress, improve mood, and lower catecholamine and cortisol levels, cardiovascular response to stress, blood pressure, and other indices of sympathetic activation in both healthy and clinical populations, including adults with diabetes .

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

1. The exclusion of dissertations, unpublished works, and abstracts made this systematic study limited.
2. Additionally, even though every attempt was made to find all pertinent research that met our inclusion criteria, some controlled trials of yogic activities might have gone unnoticed if the publication did not mention the phrase yoga or yogic.
3. Numerous studies included here have flaws in their methodology, inadequate reporting, and other restrictions that make it difficult to understand the results and draw firm conclusions.
4. Participants were not randomly assigned to therapy in over half of the investigations, which increases the possibility of selection bias. Of the twelve randomised controlled trials, two provided details on the randomisation process

CONCLUSION

In summary, yogic practices may significantly enhance a number of indices that are crucial for managing type 2 diabetes, such as BMI, improvements in lipid profile, anthropometric measurements, pulmonary measures, insulin sensitivity, blood glucose levels, nerve conduction, and quality of life. Further the research indicates that yoga may also improve pulmonary and neurological system function, lower blood pressure and elevate mood, sleep, and quality of life, and lessen the need for medication in adults with DM2. However, results need to be interpreted cautiously because of methodological limitations and the heterogeneity of previous investigations. To validate and clarify the possible therapeutic advantages of standardised yoga programs in DM2 individuals, more excellent research is needed for promising outcomes of yoga for type II diabetes

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interests regarding the publication of this paper.

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