



# International Journal of Alternative and Complementary Medicine

Available at [www.saap.org.in](http://www.saap.org.in)

ISSN: 2583-1305



## Role of yoga therapy in the management of diabetic neuropathy: a review article

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### Abstract

**Background:** Autonomic Diabetic Neuropathy, the most frequent diabetic consequence, is commonly treated with medicines without success. Diabetes is a chronic disease due to insulin resistance or reduced insulin secretion, India is known as the "diabetic world capital," with a projected growth of 63 %, exceeding 98 million by 2030. The latest diabetes mellitus statistics are worrying, stating that around 150 million individuals globally have diabetes mellitus, with this number expected to doubling by 2025.

**Objective:** The purpose of the study was to conduct a review on role of Yoga in the management of Autonomic Diabetic Neuropathy.

**Method:** A review was conducted using search terms Autonomic Diabetic Neuropathy and Yoga, Autonomic Diabetic Neuropathy and Alternative Therapy, Diabetic Autonomic Neuropathy and Yoga, Diabetic Autonomic Neuropathy and Alternative Therapy, Diabetic Neuropathy and Yoga, Diabetic Neuropathy and Alternative therapy and all the probable term in national and international data repositories such as PubMed, google scholar, in English language. Only 5 studies are selected out of 1493. For this Review article Literature Searched from starting to till April 2022.

**Conclusion:** Studies showing clinical significance of Yoga in the management of Diabetic Neuropathy, but studies are less available and also lack of quality study. New Researchers should create more original evidences by conducting Randomized Controlled Trials in the large sample size.

**Key Words:** *Autonomic Diabetic Neuropathy, Yoga, Alternative Therapy*

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DOI: <https://doi.org/10.46797/ijacm.v3i2.336>

### Produced and Published by

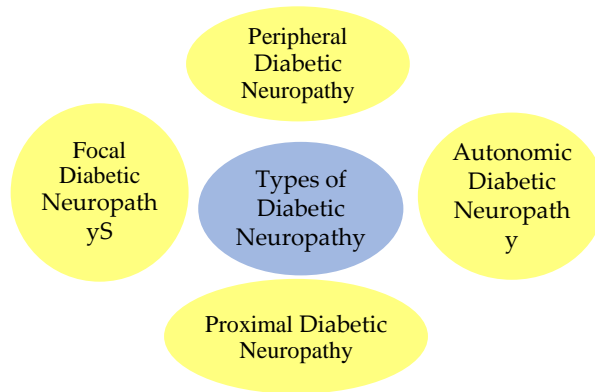
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### Introduction

Ageing, bad diets, obesity, and a sedentary lifestyle all contribute to type 2 diabetes. The latest diabetes mellitus statistics are worrying, stating that around 150 million individuals globally have diabetes mellitus, with this number expected to doubling by 2025. The majority of the increase in the diabetes population is expected to occur in developing nations, with population growth and sedentary lifestyles as the most likely contributory

causes (NCD Risk Factor Collaboration, 2016). With such a prevalence of 60 million diabetics in 2011, India is known as the "diabetic world capital," with a projected growth of 63 %, exceeding 98 million by 2030 [1]. Years of poorly controlled high blood sugar can result in a variety of cardiac problems affecting tiny (microvascular), large (macrovascular), or both vessels. One of the most serious consequences of type 2 diabetes is autonomic dysfunction. Diabetic autonomic dysfunction is asymptomatic in 50% of diabetics and has a severe impact on people's lives [2]. There are various forms of diabetic neuropathy. This is because our bodies include several types of nerves that perform various activities. The symptoms and treatments you receive are determined by the type of diabetic neuropathy you have. Diabetic neuropathy is classified into four

categories: (i) Neuropathy of the periphery (also called diabetic nerve pain and distal polyneuropathy), (ii) Autonomic neuropathy, (iii) Proximal Neuropathy and (iv) Focal Neuropathy (also called mononeuropathy) [3].



One of the primary causes of morbidity and mortality among diabetics is cardiovascular autonomic neuropathy [4]. A recent study showed that both the parasympathetic and sympathetic nerve systems are involved in type 2 diabetes [5]. Asana practise, regulated breathing, cleansing techniques (kriya), meditation, and lessons on yoga therapy (the concept of yoga, the streams of yoga, and the basis of yoga therapy) have all been shown to reduce prescription drug marks, plasma glucose levels, HbA1C levels, and blood lipid levels in patients with T2 diabetes mellitus (DM) [6] Chronic symptoms of painful diabetic peripheral neuropathy (PDPN) are generally the most annoying. It has been well documented that diabetic peripheral neuropathy is connected with sadness, sleep disturbance, and a lower quality of life (QOL) [7]. Autonomic Neuropathy is normally treated with a combination of topical and oral medications. In order to alleviate uncomfortable symptoms, many patients turn to a variety of treatments (including over-the-counter drugs). In contrast to earlier drugs, newer ones are more expensive and have a greater risk of adverse effects, making them less effective at relieving pain. Patients with Autonomic Neuropathy face an uphill battle in finding treatments that are both effective and low risk in order to alleviate their discomfort and enhance their overall well-being. Many people with Autonomic diabetic neuropathy turn to alternative therapies because they are dissatisfied with the results of standard medical treatments [8].

**Table 1: Characteristics and findings from the selected studies:**

Study & year	Intervention	Comparison	Assessments	Study design	Outcome (s)	Sample Size &	(Frequency *session* Length intervention *duration) =Total dose in minutes	Duration
“Effect of 3-Month Yoga on Oxidative Stress in Type 2 Diabetes With or Without	Tadasana, padahastasana, vrikshasana, trikonasana, parshvoothanasana, vajrasana, vakrasana, gomukasana, paschimotasana,	standard care alone	Baseline & 3 month	Controlled trial	anthropometry, blood pressure, glycaemic control, and oxidative stress	n= 123 & Karnataka	3 days/week for 3 months.	3 months

Complications" (2011) [9]	uttanapadasana, pawanamuktasana, bhujangasana, shalabhasana, dhanurasana, viparitarikarani, sitkari and bhamari pranayama, anuloma viloma, and shavasana poses							
"Progressive Muscle Relaxation and Mindfulness Meditation on Neuropathic Pain, Fatigue, and Quality of Life in Patients with Type 2 Diabetes: A Randomized Clinical Trial" (2020) [10]	"progressive muscle relaxation" and "mindfulness Meditation"	standard care	Baseline, 12 week & 14 weeks	An assessor-blinded prospective randomized controlled trial.	"VAS", "FACIT Fatigue Scale (FACIT-F)", and "Neuropathic Pain Impact on Quality-of-Life Questionnaire" (NePIQoL).	n= 77 & Turkey	20 min daily for 12 weeks	12 weeks
"Mindfulness-Based Meditation Versus Progressive Relaxation Meditation: Impact on Chronic Pain in Older Female Patients With Diabetic Neuropathy" (2019) [11]	"Mindfulness meditation" and "progressive relaxation"	standard care	last 24 hours at study end compared to baseline	Controlled trial	Analgesic effectiveness required changes in average daily pain "Brief Pain Inventory (BPI)" modified for painful diabetic peripheral neuropathy	n=105 & UAE	16 sessions of 15 minutes of discussion followed by 20 minutes of sitting quietly and were told to relax as best as possible.	3 months

<p>“Mediators and moderators of change in mindfulness-based stress reduction for painful diabetic peripheral neuropathy” (2019) [12]</p>	<p>“Mindfulness-based stress reduction (MBSR)”</p>	<p>Standard care</p>	<p>Baseline &amp; 8 weeks</p>	<p>Randomized controlled trial</p>	<p>“The Brief Pain Inventory, Short-Form”, “The Five Facets Mindfulness Questionnaire” (FFMQ) &amp; “Patient Health Questionnaire-9”</p>	<p>n=62 &amp; Canada</p>	<p>5/week for 8 weeks</p>	<p>8 weeks</p>
<p>“The Effect of Mindfulness Meditation on Painful Diabetic Peripheral Neuropathy in Adults Older Than 50 Years” (2010) [13]</p>	<p>“Mindfulness Meditation”</p>	<p>Standard care</p>	<p>Baseline &amp; 4 weeks</p>	<p>Pilot study</p>	<p>“Neuropathic Pain Scale” (NPS), “NeuroQoL”, and the “Pittsburgh Sleep Quality Index” (PSQI).</p>	<p>n=22 &amp; United States</p>	<p>5 days per week over a 4-week period</p>	<p>4 weeks</p>

**Discussion**

Shreelaxmi V et.al (2011) found in a controlled clinical trial, 123 patients were with microvascular complications, macrovascular complications, and peripheral neuropathy; those without complications; and those who received standard care and additional yoga for three months. oxidative stress was reduced by 20% in yoga practitioners and in the yoga group, malondialdehyde decreased by 20% and HbA1c decreased by 1.4 %. Malondialdehyde and HbA1c levels rose on average by 3.2% and 6.25 %, respectively, in the study's control group. Glutathione and vitamin C levels dropped significantly in the control group.

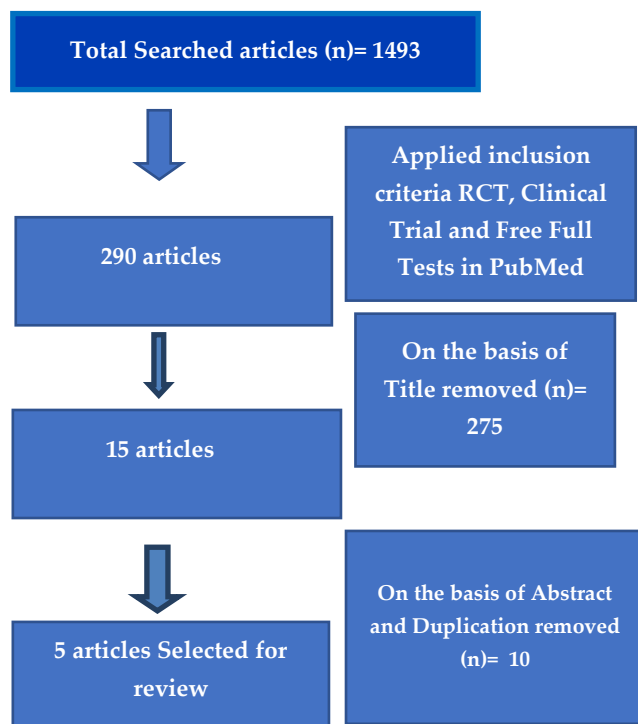
Nur Lzgu et.al (2020) reported in single blinded Randomized Controlled Trial, Participants were assigned to three groups: the relaxation (RG; 28), the meditation (MG; 25), or the control (CG; 24) group. Progressive muscle relaxation or mindfulness meditation were conducted at home by the patients in the intervention groups for a total of 12 weeks, 20 minutes each day. The CG was only given an education about the anatomy of the pancreas and diabetes that was closely monitored. The VAS, FACIT Fatigue Scale (FACIT-F), and Neuropathic Pain Impact on Quality-of-

Life Questionnaire were used to gather data at baseline and at weeks 12 and 14. (NePIQoL). In the Relaxation Group and the Meditation Group, VAS scores were statistically significant at week 12 (p .05) and week 14 (p .05). At weeks 12 and 14, tiredness severity decreased significantly in the RG compared to the Control Group (p.05).

Nadia Hussain et.al (2019) founded as of the study's conclusion, the daily average pain in the last 24 hours had decreased by 28.7 % and 39.7 %, respectively, for both groups. By the end of the 12th week of treatment, the pain level in Group MM had decreased from 5.2 to 3.0. At the conclusion of the trial, patients' opinions of groups Mindfulness Meditation (MM) and Progressive Muscle Relaxation (PMR) had improved significantly, with 75% (n 14 36) and 61 % (n 14 32) reporting more satisfaction. After 12 weeks, in Group MM, patient satisfaction levels rose from 3.0 to 3.8.

Karolina A et. al (2019) stated that for patients suffering from Painful Diabetic Peripheral Neuropathy, his study offers new insight into the benefits of Mindfulness Based Stress Reduction on severe pain. MSBR's theoretical and clinical relevance for the treatment of pain will benefit from additional investigation.

### Flowchart of screening of Articles for Review



### Conclusion

Studies showing clinical significance of Yoga in the management of Diabetic Neuropathy, but studies are less available and also lack of quality study. New Researchers should create more original evidences by conducting Randomized Controlled Trials in the large sample size. Integration of Yoga with standard care for Diabetic Neuropathy Management may be crucial effective among Diabetes Mellitus Patients.

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