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## Exploring the role of yoga and meditation in managing hypertension: Insights from a hospital-based cross-sectional study in Uttar Pradesh

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### Abstract

**Introduction:** Recognizing the potential of yoga and meditation as non-pharmacological interventions for hypertension management, this study aimed to evaluate their impact on blood pressure control among hypertensive patients.

**Methods:** A hospital-based cross-sectional study in a district in Uttar Pradesh involving 400 hypertensive patients was conducted, employing independent t-tests for statistical analysis.

**Results:** The study revealed significant reductions in both systolic and diastolic blood pressure among patients practicing yoga and meditation.

**Conclusion:** Our findings demonstrate a notable decrease in both systolic and diastolic blood pressure among hypertensive patients engaged in yoga and meditation. These results emphasize the potential benefits of integrating non-pharmacological approaches such as yoga and meditation into hypertension management strategies, providing a promising avenue for blood pressure control.

**Keywords:** Cardiovascular disease, stress, blood pressure, pranayama, lifestyle modification

### Introduction

Cardiovascular diseases (CVD) represent a significant health concern in India, projected to become the leading cause of both mortality and disability by 2020. Alarming, nearly half of these fatalities are expected to occur among young and middle-aged individuals, highlighting the pressing need for proactive measures to address this imminent public health challenge <sup>[1]</sup>. Hypertension (HTN) stands out as the predominant cardiovascular condition, representing a critical modifiable risk factor for a spectrum of serious health issues including coronary heart disease (CHD), stroke, congestive heart failure (CHF), end-stage renal disease (ESRD), and peripheral vascular disease (PVD). Among the various triggers of hypertension, stress emerges as a significant contributing factor, necessitating attention due to its potential impact on overall cardiovascular health <sup>[2]</sup>. The intricate relationship between stress and hypertension creates a concerning cycle, with each exacerbating the other. This association raises alarm, particularly in the context of rapid urbanization, modernization, industrialization, migration, and the demanding occupational and educational landscape of today's competitive world. These factors collectively contribute to heightened stress levels in individuals, which if prolonged, can precipitate hypertension. Moreover, advancements in quality of life and healthcare have prolonged lifespans, consequently increasing the prevalence of chronic conditions associated with aging, such as hypertension. Awareness of one's hypertensive condition can in itself induce stress <sup>[3]</sup>, further complicating the management of hypertension.

While lifestyle modification remains a fundamental aspect of hypertension (HTN) treatment, stress reduction strategies are frequently overlooked in conventional recommendations. Yoga, an ancient Indian practice, offers promising avenues for stress reduction and the improvement of HTN. Through a combination of yogic asanas (exercises) and pranayama (controlled breathing techniques), yoga demonstrates efficacy in alleviating stress and managing hypertension. Notably, yoga exhibits immediate psychological benefits by reducing anxiety levels, underscoring its potential as a holistic approach to HTN management <sup>[4, 5]</sup>. and enhances emotional, social, and spiritual vitality <sup>[6]</sup>. It exerts beneficial impacts on CVDs <sup>[7]</sup>.

Over extended practice, yoga influences the hypothalamus, resulting in a decrease in both systolic and diastolic blood pressure by modulating the vasomotor center. This modulation leads to a reduction in sympathetic tone and peripheral resistance, contributing to the overall management of blood pressure levels [8]. Several research investigations have demonstrated that yoga effectively reduces anxiety, stress, and salivary cortisol levels [9, 10]. Additionally, yoga has been shown to lower plasma renin levels and reduce levels of 24-hour urine norepinephrine and epinephrine [11]. Similar to yoga, meditation has demonstrated effectiveness in lowering blood pressure.<sup>12, 13</sup> Both yoga and meditation emerge as promising adjuncts in the prevention and treatment of hypertension, offering accessibility, affordability, and a lack of reported side effects when practiced correctly. They can be complemented with pharmacological treatments seamlessly. However, there remains a scarcity of research investigating the awareness and adoption of these practices among hypertensive patients. This study aimed at estimating the practice of yoga and meditation in hypertensives and its impact on blood pressure (BP) control.

### Materials and Methods

The present study is a quantitative, hospital-based, cross-sectional study conducted in the Mathura, a district in Uttar Pradesh, India in the year 2018-2019.

### Sample size calculation and sampling technique

Sample size (N) was calculated using the formula  $4pq/L^2$  where p represents the expected population, q is calculated as 100 minus p, and L signifies the relative precision. At a 95% confidence interval, with a prevalence (p) estimated at 50% and L set at 10% of p, a sample size of 400 was calculated. Data collection occurred exclusively during patients' initial visits to the outpatient department following the study's commencement. To prevent duplication, if a patient had previously participated in the study, the next patient was selected.

### Inclusion Criteria

1. Patients must be at least 30 years of age.
2. Patients with a confirmed diagnosis of hypertension.

### Exclusion Criteria

1. Patients who decline to participate.
2. Patients who are critically or mentally unwell.
3. Pregnant patients.

### Data Collection

Data was gathered through personal interviews conducted using a pre-tested, semi-structured proforma. The proforma included inquiries regarding socio-demographic factors, medical history, family history, presence of any co-morbid conditions, as well as the patient's knowledge and attitude towards hypertension. Additionally, it inquired about their practices for controlling the disease, encompassing yoga (asanas and pranayama) and meditation. In this study, the practice of yoga or meditation for 30-45 minutes per day, at least five days a week, was considered necessary. Anthropometric measurements and clinical examinations were also conducted as part of the data collection process.

### Statistical analysis

The data entry was done using Microsoft Office Excel. To summarize the data, descriptive statistics of frequency, percentages, mean and standard deviation (SD) were used. Relationship between practice of yoga and meditation and its impact on BP management was tested by using independent t tests calculated by MedCalc software. Alpha level was set at to 0.05 (5%).

### Results

Table 1 shows that the age distribution within the sample was as follows: 8% (32) fell between 30-39 years, 26.8% (107) were aged 40-49 years, 25.5% (102) were aged 50-59 years, 27% (108) were aged 60-69 years, and 12.8% (51) were aged over 69 years. Gender-wise, 58% (232) were male, and 42% (168) were female. The religious affiliation of the participants leaned towards Hinduism, constituting almost 83% of the total, with Muslims comprising 16.5%. Marriage status indicated that the majority were married (87.8%), while a smaller proportion were single (12.6%). Approximately 75.5% of the participants were literate. Occupation-wise, the primary occupations were homemakers (38.3%) and individuals employed in the private sector (21.5%). Table 2 shows that there are statistically significant ( $p < 0.05$ ) differences in BP of those who were and weren't practicing yoga and meditation.

**Table 1:** Socio-demographic profile of the study sample (N=400)

Socio-demographic Variables	No	Percentage (%)
<b>Age group (in completed years)</b>		
30-39	32	8
40-49	107	26.75
50-59	102	25.5
60-69	108	27
>69	51	12.75
<b>Sex</b>		
Male	232	58
Female	168	42
<b>Religion</b>		
Hindu	331	82.75
Muslim	66	16.5
Others	3	0.75
<b>Literacy status</b>		
Illiterate	98	24.5
Literate	302	75.5
<b>Marital Status</b>		
Married	351	87.75
Single	49	12.25
<b>Occupation</b>		
Private sector	86	21.5
Business	29	7.25
Farmer	30	7.5
Service	28	7
Housewife	153	38.25
Retired	56	14
Others	18	4.5
<b>Duration of HTN</b>		
≤ 5 years	256	64
>5 years	144	36

**Table 2:** Impact of yoga and meditation in control of BP among patients (N=400)

Yoga and Meditation	Mean SBP±SD (in mmHg)	p value	Mean DBP±SD (in mmHg)	p value
Practicing (n=46)	136.6±10.4	0.0016*	83.8±9.4	P = 0.0001*
Non-practising (n=354)	145.3±18.2		90.2±10.1	

\*p value <0.05 (statistically significant)

## Discussion

This study individuals aged 30-59 years, a demographic typically associated with peak economic productivity. Intriguingly, the prevalence of hypertension was lowest among the younger age groups, a trend in line with findings from studies conducted in Jamnagar city<sup>[18]</sup>. The majority of patients were female, a consistent pattern observed across diverse regions such as Turkey, India, the USA, and Nigeria, aligning with previous research<sup>[19, 22]</sup>. Most of the patients who were enrolled were married (86.5%) and housewives (45.3%). In alignment with our study, Jesus ES *et al.*, in their research conducted in Sao Paulo, noted a predominance of female patients, with the majority falling within their fifties. Additionally, a significant proportion of their patients were married and engaged in homemaking activities<sup>[23]</sup>.

In our study, we found that patients who practiced yoga and/or meditation demonstrated lower systolic blood pressure (SBP) and diastolic blood pressure (DBP) compared to non-practicing patients, with reductions of 8.7 mmHg and 6.4 mmHg, respectively, which proved to be statistically significant. Similarly, a study conducted in Gujarat reported a significant decrease in SBP, although the reduction in DBP was not statistically significant<sup>[18]</sup>. In a randomized controlled trial by Saptharishi L *et al.*, the intervention of yoga alone resulted in a reduction of 2 mmHg in systolic blood pressure (SBP) and 2.9 mmHg in diastolic blood pressure (DBP)<sup>[24]</sup>. Singh *et al.* documented a significant reduction of 12 mmHg in systolic blood pressure (SBP) and 11.2 mmHg in diastolic blood pressure (DBP) following a 40-day yoga regimen among individuals with Type 2 diabetes<sup>[25]</sup>. Anderson JW *et al.* found that engaging in transcendental meditation led to a reduction in systolic blood pressure (SBP) by approximately 4.7 mmHg and diastolic blood pressure (DBP) by 3.2 mmHg<sup>[26]</sup>.

## Conclusion:

Hypertension represents a widespread epidemic and it's of concern because it exhibits the iceberg phenomenon, typically. Despite the use of pharmacological treatments, its prevention and management remain challenging. However, integrating non-pharmacological approaches such as exercise, yoga, and meditation into treatment regimens can significantly contribute not only to lowering blood pressure but also to enhancing overall patient well-being. Our study, like many others, demonstrates that patients who practice yoga and meditation experience lower blood pressure levels. Therefore, adopting an integrated approach where healthcare professionals advise on these lifestyle modifications alongside prescribed medications can address the awareness gap regarding the benefits of yoga and meditation highlighted in our study. This integrated approach holds promise for achieving better blood pressure control and improving patient outcomes.

## References

1. Global Burden of Disease: Update. Geneva: WHO; [Last accessed on 2013 Jun 30]. Who's certified; c2004

Available

from: [http://www.who.int/healthinfo/global\\_burden\\_disease/GBD\\_report\\_2004update\\_full.pdf](http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004update_full.pdf)

2. Davison C, Davey SG, Frankel SJ. Lay epidemiology and the prevention paradox: the implications of the coronary candidate for health promotion. *Soc Health Illness*. 1991;13:1-19.
3. Rostrup M, Kjeldsen SE, Eide IK. Awareness of hypertension increases blood pressure and sympathetic responses to cold pressor test. *Am J Hypertens*. 1990;3:912-917.
4. Michalsen A, Grossman P, Acil A, Langhorst J, Ludtke R, Esch T, *et al.* Rapid stress reduction and anxiolysis among distressed women as a consequence of a three month intensive yoga program. *Med Sci Monit*. 2005;11:555-561.
5. West J, Otte C, Geher K, Johnson J, Mohr DC. Effects of Hatha yoga and African dance on perceived stress, affect, and salivary cortisol. *Ann Behav Med*. 2004;28:114-118. [PubMed: 15454358]
6. Moadel AB, Shaw C, Wylie-Rossett J, Harris MS, Patel SR, Hall CB, *et al.* Randomized controlled trial of yoga among a multiethnic sample of breast cancer patients: Effects on quality of life. *J Clin Oncol*. 2007;25:1-9. [PubMed: 17785709]
7. Raub JA. Psychophysiologic effects of hatha yoga on musculoskeletal and cardiopulmonary function: A literature review. *J Altern Complement Med*. 2002;8:797-812. [PubMed: 12614533]
8. Khanam AA, Sachdeva V, Gulera R, Deepak KK. Study of pulmonary and autonomic functions of Asthma patients after Yoga training. *Indian J Physiol Pharmacol* 1996; 40(1):318-321.
9. Michalsen A, Grossman P, Acil A, Langhorst J, Ludtke R, Esch T, *et al.* Rapid stress reduction and anxiolysis among distressed women as a consequence of a three month intensive yoga program. *Med Sci Monit* 2005;11:555-61.
10. West J, Otte C, Geher K, Johnson J, Mohr DC. Effects of Hatha yoga and African dance on perceived stress, affect, and salivary cortisol. *Ann Behav Med* 2004;28:114-118.
11. Selvamurthy W, Sridharan K, Ray US, Tiwary RS, Hedge KS, Radhakrishnan U, *et al.* A new physiological approach to control essential hypertension. *Indian J Physiol Pharmacol*. 1998;42:205-13.
12. Goldstein CM, Josephson R, Xie S, Hughes JW. Current Perspectives on the Use of Meditation to Reduce Blood Pressure. *International Journal of Hypertension*. 2012;2012:578397. doi:10.1155/2012/578397.
13. Anderson JW, Liu C, Kryscio RJ. Blood pressure response to transcendental meditation: a meta-analysis. *Am J Hypertens*. 2008 Mar;21(3):310-316. doi: 10.1038/ajh.2007.65. PubMed PMID: 18311126.

14. Lwanga SK, Lemeshow S. Sample size determination in health studies. A practical manual, World Health Organization, Geneva; c1991.
15. Sarkar A, Makwana N, Pithadia P, Parmar D. Compliance to Antihypertensive Therapy and its Predictors: A Cross-sectional Study in Western Coastal Region of India. *Journal of Clinical and Diagnostic Research*. 2018 Mar;l-12(3):LC26-LC30. doi: 10.7860/JCDR/2018/31867.11345
16. Anand MP. Non-pharmacological management of essential hypertension. *J Indian Medical Assoc* 1999;97:220-225.
17. All India Consumer Price Index (General) for Industrial Workers. Available from <http://cyberjournalist.org.in/manisana/aicpinew.html> [Last accessed on 9/20/2017]
18. Sarkar A, Roy D, Bundela CV, Gohel A, Makwana NR, Parmar DV. A hospital-based cross-sectional study on yoga and meditation in patients of hypertension in Western India. *Int J Community Med Public Health* 2019;6:1205-1210.
19. *Journal of Public Health and Epidemiology*. 2010;2(4):71-77
20. Karaeren H, Yokuşoğlu M, Uzun S, Baysan O, Köz C, Kara B, *et al*. The effect of the content of the knowledge on adherence to medication in hypertensive patients. *Anadolu Kardiyol Derg*. 2009;9(3):183-188
21. George R, D'Silva F, D'Souza JL: Perceived Barriers and Effectiveness of Planned Teaching Programme on Life Style Modification Practices of Persons with Hypertension-A Study in Dakshina Kannada, Mangalore JKIMSU. 2012;1(2):117-123
22. Chiazor IE, Oparah CA. Assessment of Hypertension Care in a Nigerian Hospital *Tropical Journal of Pharmaceutical Research*. 2012;11(1):137-145
23. Jesus ES, Augusto MAO, Gusmão J, MionJúnior D, Ortega K, Pierin AMG. Profile of hypertensive patients: biosocial characteristics, knowledge, and treatment compliance. *Acta Paul Enferm* 2008;21(1):59-65.
24. Saptharishi L, Soudarssanane M, Thiruselvakumar D, Navasakthi D, Mathanraj S, Karthigeyan M, *et al*. Community-based randomized controlled trial of non-pharmacological interventions in prevention and control of hypertension among young adults. *Indian J Community Med* 2009;34:329-334.
25. Singh S, Malhotra V, Singh KP, Madhu SV, Tandon OP. Role of yoga in modifying certain cardiovascular functions in type 2 diabetic patients. *J Assoc Physicians India* 2004;48:461-465.
26. Anderson JW, Liu C, Kryscio RJ. Blood pressure response to transcendental meditation: a meta-analysis. *Am J Hypertens*. 2008 Mar;21(3):310-316. doi: 10.1038/ajh.2007.65. PubMed PMID: 18311126.