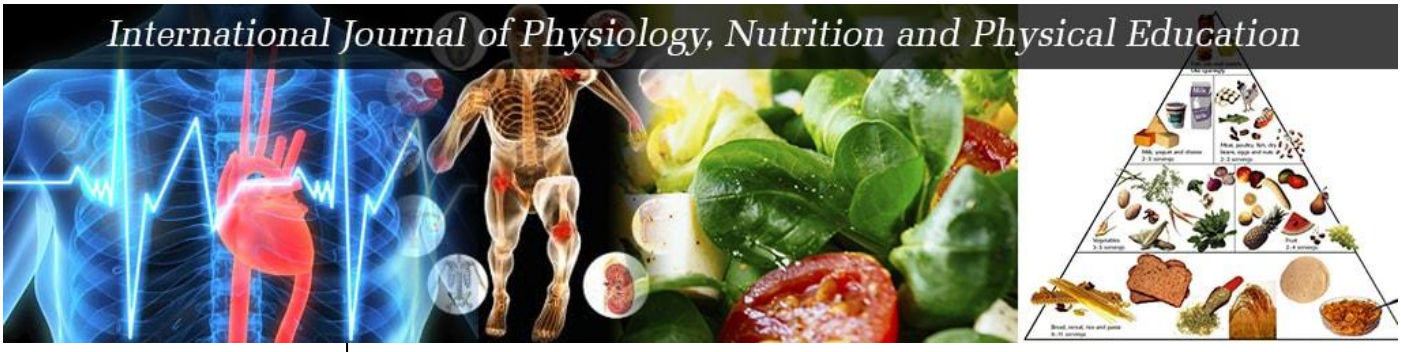

ISSN: 2456-0057
IJPNPE 2026; 11(1): 21-23
Impact Factor (RJIF): 5.91

www.journalofsports.com
Received: 11-10-2025
Accepted: 13-11-2025

Dr. Aloke Sen Barman
Assistant Professor, Department of Physical Education, Seva Bharati Mahavidyalaya, Kapgari, Jhargram, West Bengal, India

Corresponding Author:
Dr. Aloke Sen Barman
Assistant Professor, Department of Physical Education, Seva Bharati Mahavidyalaya, Kapgari, Jhargram, West Bengal, India

Effect of yoga on arterial hypertension

Aloke Sen Barman

DOI: https://www.doi.org/10.22271/journalofsport.2026.v11.i1a.3129

Abstract
The term "silent killer" refers to the chronic illness known as arterial hypertension, or high blood pressure, in which the force of blood against artery walls is continuously too high, causing the heart to work harder and damage arteries, frequently without any early symptoms. In order to prevent major problems like heart attacks and strokes treated with drugs and lifestyle modifications. The main objective of this study was to do a systematic review to examined the effects of yoga intervention on arterial hypertension. Data was collected from PubMed, JSTORE and Web of Science. Randomized controlled trials published in English from the inception of the database until 10th January, 2026, were included. Only yoga as intervention were included in the study. The yoga intervention had a significant effect on arterial hypertension. It may be concluded that yoga can be elicited significantly improvement from arterial hypertension that may be due to stress-reducing effects that are most likely due to a regulation of the function of the autonomic nervous system. Besides, the physical postures, depending on the intensity and duration of hold, may result in an optimized cardiac function and muscular function, if executed regularly.

Keywords: Yoga, arterial, hypertension

Introduction
Cardiovascular diseases (CVDs) and arterial hypertension (AHT) continue to be major public health concerns [1]. Currently, AHT affects over one-third of the world's population, and the number of affected individuals is continuously rising [2, 3]. Secondary events are frequent and optimal therapy is required because AHT is frequently diagnosed with a latency [4]. Environmental and behavioural variables account for the majority of high blood pressure (BP) risk factors [5, 6]. Treatment is based on lifestyle optimisation in a number of national and international standards [7]. Additionally, based on a patient's unique circumstances and medical background [9, 11], medicines should be added [8-10]. The substantial co-prevalence of raised heart rate (HR) among patients with hypertension raises the possibility of HR reducing treatments in light of the link between higher HR and cardiovascular morbidity and mortality risk, even though there are currently no specific recommendations [12]. Since the autonomic nervous system controls both blood pressure and heart rate, stress-reduction strategies that support autonomic regulation may also lower blood pressure and heart rate. Yoga can help in this process by reducing stress and promoting physical exercise. The autonomic nervous system's regulation of function is most likely the cause of the stress-relieving effect [13]. As a result, adding yoga to AHT therapy can be beneficial. Yoga was first used to refer to an Indian philosophy that included a variety of spiritual and physical exercises. It emphasises a complete lifestyle shift in addition to physical activation [14]. Internationally, only a portion of the original concept is used. Yoga is mostly known in Western culture as a type of physical exercise that involves stretching and body postures, along with breathing techniques and/or meditation [14, 15]. These elements can be combined in many ways, and the posture exercises can be customised to fit each person's skill level. Although this can help with patient care, it also makes comparing various programs challenging. Thus far, yoga therapies have demonstrated benefits for a number of CVDs and risk factors, including metabolic syndrome [17, 21], type-2 diabetes [19, 20], chronic heart failure [18], and coronary heart disease [16, 17]. Numerous systematic reviews and/or

Meta-analyses have indicated a possible advantage in terms of the impact on blood pressure levels [22-27], but it is still challenging to compare them because of the vast variety of diverse study inclusion criteria. Randomised controlled trials (RCTs) that measured blood pressure were included in one meta-analysis, but those with participants on medication were not included [22]. Others included RCTs with pre-to-hypertensive average blood pressure levels; however, it was unclear if all individuals had an AHT diagnosis [23]. Additionally, a systematic review without a meta-analysis was conducted by three authors [25-27]. RCTs involving solely prehypertensive and hypertensive individuals, as well as lengthier program duration with follow-up, have only been included in one systematic review and meta-analysis to yet. Their findings were encouraging but not definitive [24]. From this point of view the researcher intends to find out the mechanism behind the decrease in arterial hypertension by practising yoga.

Methods

A systematic literature search was conducted in PubMed, Web of Science, and J-Store with no data restrictions, up to 10th January, 2026. Yoga training intervention studies were included. In total, data from 566 research articles were included for the synthesis of this review regarding measures of arterial hypertension were extracted from these studies.

Result and Discussion

566 records were found in the literature search. Following the screening of non-duplicate article titles and abstracts, 247 records were eliminated due to their lack of randomisation, participants' lack of a diagnosis of (pre-) hypertension, and/or the absence of yoga as an intervention. The eligibility of 53 full-text publications was evaluated. Nine of these studies lacked randomisation. There was just a conference abstract available for one record, and one duplicate article was eliminated. Participants without hypertension were also included in three RCTs. Two more were eliminated because, despite the inclusion of hypertensive individuals, blood pressure readings were not tracked as a result. Twelve more articles that used multimodal therapies or did not use yoga as an intervention at all were eliminated. Seven RCTs did not conduct any follow-up and instead concentrated on a single session or the immediate impact on blood pressure. Because of their cross-over design, which resulted in study cohort overlap with other included research, three studies were eliminated. 27 RCTs with 1843 participants were included. Very low quality of evidence was found for positive effects of yoga on systolic blood pressure (SBP, 23 RCTs, n = 1841; MD = -7.92 mmHg, 95% CI = -10.21 to -5.665 p<0.01), diastolic blood pressure (DBP, 17 RCTs, n = 1634; MD = -4.91 mmHg, 95% CI = -6.22 to -3.46, p<0.01) and heart rate (HR, 12 RCTs, n = 1029; MD = -4.41 mmHg, 95% CI = -7.32 to -1.43, p<0.01) compared to waitlist control. Compared to active control, very low quality of evidence was found for positive effects yoga on SBP (4 RCTs, n = 301; MD = -4.14 mmHg, 95%CI = -10.71 to 2.42, p = 0.22), DBP (4 RCTs, n = 301; MD = -1.86 mmHg, 95%CI = -3.21 to -0.34, p = 0.02) and HR (2 RCT, n = 126; MD = -5.14 mmHg, 95% CI = -8.31 to -1.90, p<0.01). Overall, the studies showed a high degree of heterogeneity. The effects found were robust against selection, detection and attrition bias. Unfortunately, meta-regression did not support our hypothesis that lengthier yoga sessions would have greater benefits on SBP, DBP, and HR. Studies comparing yoga to standard treatment did not find a significant relationship between the overall time of yoga interventions and reducing effects on SBP, DBP, and HR. Only publication bias was found for the HR result, which may be partially explained by the limited sample size of only ten studies.

Conclusion

The BP is influenced by a variety of factors. On the one hand, it reduces stress, which is probably because the autonomic nervous system is regulated [13]. Additionally, if performed on a regular basis, the physical postures may lead to an optimal cardiac and muscular function, depending on the intensity and duration of hold. A general improvement in physical function could result from this, making daily living easier. Although there are still a lot of unsolved problems, this finding indicate that yoga may be a useful adjunct for both therapy and primary prevention of AHT. We still need additional information regarding the dosage, the combination of yoga aspects, and the target demographic for whom yoga may be most effective due to the small number of research. Additionally, it's critical to assess the demographic that would be interested in making yoga a regular part of their daily routine in order to lower blood pressure. For instance, qualitative research methods like patient-focused interviews could do this.

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