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# CARDIORESPIRATORY ADAPTATIONS TO YOGA: MECHANISMS, TRAINING STIMULUS, AND IMPLICATIONS FOR $VO_2$MAX: A LITERATURE REVIEW

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**ABSTRACT**

The effects of yoga on cardiorespiratory fitness and $VO_2$max remain inconsistent, partly because yoga practices vary substantially in modality and physiological training stimulus. This literature review synthesized evidence on the effects of yoga on $VO_2$max and cardiorespiratory fitness, with emphasis on training stimulus and potential physiological mechanisms. A total of 1,072 records published between 2001 and 2024 were identified through PubMed/MEDLINE, Scopus, Web of Science, and Google Scholar using keywords related to yoga, $VO_2$max, aerobic capacity, cardiorespiratory fitness, and physiological adaptation. Following screening and eligibility assessment, 13 studies were included in the review. Data were synthesized according to yoga modality, training frequency, intervention duration, participant characteristics, and methods used to assess cardiorespiratory fitness. Most chronic intervention studies reported improvements in $VO_2$max or aerobic capacity, with increases of approximately 1.9–9.8 mL/kg/min. Improvements were observed following Hatha, intensive Hatha, integrated yoga, and high-intensity cardio yoga, whereas Bikram yoga, once-weekly high-intensity Hatha yoga, and habitual yoga practice showed no significant improvements. The findings suggest that cardiorespiratory adaptation may depend more on the magnitude and cumulative dose of physiological training stimulus than on the yoga modality itself. Yoga may improve cardiorespiratory fitness when practiced with sufficient and repeated physiological stimulus. However, substantial heterogeneity limits generalization across modalities.

Keywords: aerobic capacity; cardiorespiratory fitness; exercise; $VO_2$max ; yoga

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## INTRODUCTION

Cardiorespiratory fitness (CRF) is a major determinant of physical performance and an important marker of overall health (Ross et al., 2024). Among the available measures of cardiorespiratory fitness, maximal oxygen uptake ($VO_2$max) is widely regarded as a key physiological indicator of aerobic capacity, reflecting the integrated capacity of the pulmonary, cardiovascular, and skeletal muscle systems to take up, transport, and utilize oxygen during strenuous exercise (Gallo-Villegas & Calderón, 2023; J. Lee & Zhang, 2021). Higher levels of cardiorespiratory fitness have been consistently associated with more favorable health outcomes, whereas low CRF is associated with increased risk of morbidity and mortality (Lang et al., 2024). Therefore, strategies capable of improving aerobic capacity remain an important component of preventive health and exercise-based interventions.

Yoga is a multidimensional mind–body practice incorporating physical postures (asanas), breathing techniques (pranayama), and meditation (Capela Santos et al., 2023; Matko et al., 2021). Unlike conventional aerobic exercise, yoga encompasses a broad spectrum of practices with substantially different movement patterns, intensity, and physiological demands. Although many Hatha yoga practices elicit low-to-moderate metabolic demands, more dynamic sequences involving rapid Sun Salutations may impose substantially greater cardiovascular and metabolic demands (Prasanna Venkatesh & Vandhana, 2022). Beyond its established effects on flexibility, balance, psychological well-being, and autonomic regulation, this variation in physiological stimulus raises the possibility that certain forms of yoga may also contribute to improvements in cardiorespiratory fitness (Ko et al., 2023).

Previous studies have reported heterogeneous findings regarding the effects of yoga on $VO_2max$ and cardiorespiratory fitness, with some trials demonstrating improvements while others reporting no significant changes (Dutta et al., 2023; Wibowo et al., 2022). Several intervention studies have demonstrated improvements in $VO_2max$ following Hatha, integrated, or high-intensity yoga practices, whereas other studies have reported no significant changes in maximal aerobic fitness or exercise capacity (Bandyopadhyay et al., 2022; Park & Yang, 2023). These discrepant findings may reflect substantial heterogeneity in yoga modality, exercise intensity, training frequency, intervention duration, participant characteristics, and methods used to assess aerobic capacity. Importantly, the term "yoga" encompasses practices with markedly different physiological demands, making it difficult to interpret the effect of yoga as a single homogeneous exercise modality (Katla et al., 2022).

Furthermore, the physiological mechanisms underlying potential improvements in $VO_2max$ following yoga remain incompletely characterized. In particular, it remains unclear whether changes in aerobic capacity following yoga are mediated primarily by cardiovascular adaptations, autonomic regulation, respiratory adaptations, or the cumulative physiological stimulus generated by repeated practice (Bhagel & Saha, 2021; Murugesan, 2024). A physiologically oriented synthesis is therefore needed to distinguish the potential mechanisms associated with improvements in $VO_2max$ from the broader health benefits of yoga that may occur independently of changes in maximal aerobic capacity.

Therefore, this literature review aims to synthesize current evidence regarding the effects of yoga on $VO_2max$ and cardiorespiratory fitness, with particular emphasis on the physiological mechanisms that may underlie these adaptations. The review further examines how yoga modality, exercise intensity, frequency, and training duration may influence the magnitude and consistency of cardiorespiratory responses, and discusses potential explanations for the heterogeneous findings reported across studies. By integrating physiological mechanisms with findings from intervention studies, this review seeks to clarify whether the cardiorespiratory benefits of yoga are attributable to yoga-specific effects or to the magnitude of the physiological training stimulus generated during practice.

## METHOD

Review Design and Objectivity

This study was conducted as a literature review to critically synthesize the current evidence regarding the effects of yoga on cardiorespiratory fitness, with particular emphasis on maximal oxygen uptake ($VO_2max$) and the physiological mechanisms that may contribute to changes in aerobic capacity. The review was designed to integrate findings from intervention studies and relevant physiological literature rather than to estimate a pooled effect size. Given the substantial heterogeneity in yoga modalities, training characteristics, participant populations, and outcome assessment methods, a literature review approach was considered appropriate to facilitate a physiologically oriented interpretation of the available evidence.

Literature Search Strategy

A structured literature search was conducted in PubMed/MEDLINE, Scopus, Web of Science, and Google Scholar to identify relevant studies addressing the relationship between yoga and cardiorespiratory fitness. The search strategy combined terms related to yoga, aerobic capacity, cardiorespiratory fitness, and maximal oxygen uptake. The following core search terms were used: “yoga,” “Hatha yoga,” “integrated yoga,” “Bikram yoga,” “aerobic capacity,” “cardiorespiratory fitness,” “$VO_2$max,” “maximal oxygen uptake,” “oxygen consumption,” “cardiorespiratory adaptation,” and “physiological mechanisms.” Boolean operators AND and OR were used to combine search concepts. The search identified studies published between 2001 and 2024. A total of 1,072 records were retrieved, of which 13 studies met the predefined eligibility criteria and were included in the final synthesis following screening and full-text assessment.

Eligibility and Study Selection
Studies were considered eligible when they met the following criteria: (1) conducted in human participants; (2) evaluated yoga as the primary intervention or exposure; (3) reported $VO_2$max, maximal oxygen uptake, cardiorespiratory fitness, aerobic capacity, or physiologically relevant measures related to aerobic exercise capacity; and (4) provided sufficient information regarding the yoga intervention or physiological outcomes. Randomized controlled trials, non-randomized intervention studies, observational studies, and relevant physiological studies were considered when they contributed to the interpretation of cardiorespiratory adaptations. Studies were excluded when yoga was combined with another exercise intervention such that the independent contribution of yoga could not be interpreted, when cardiorespiratory outcomes were not reported or discussed, when the publication was not peer-reviewed, or when the full text was unavailable. Animal studies, conference abstracts, editorials, and commentaries without substantive physiological or empirical data were also excluded. The study identification and selection process was conducted in accordance with PRISMA guidelines, and 13 articles met the eligibility criteria for inclusion in the literature review (Figure 1).

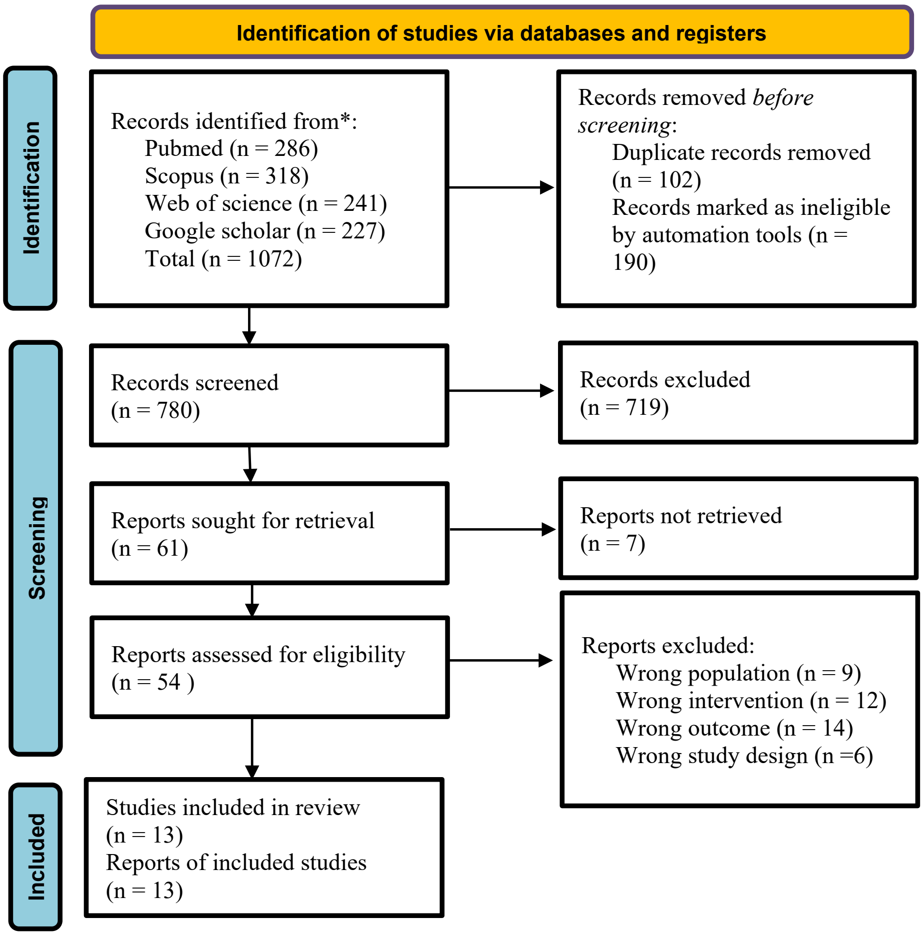

Figure 1. PRISMA flow diagram of the study selection process

**Data Extraction and Synthesis**

For each included study, relevant information was extracted into a standardized evidence table. Extracted variables included author and publication year, study design, participant characteristics, sample size, yoga modality, intervention duration, frequency and session duration, comparator characteristics where applicable, method of $VO_2max$ or cardiorespiratory fitness assessment, baseline and post-intervention values, magnitude and statistical significance of changes, and the overall direction of the findings. Additional physiological findings relevant to cardiovascular, respiratory, autonomic, metabolic, and peripheral adaptations were extracted when available.

## RESULT

The characteristics and cardiorespiratory fitness outcomes of the 13 included studies are presented in Table 1. The studies were published between 2001 and 2024 and demonstrated substantial heterogeneity in study design, population characteristics, yoga modalities, intervention dose, and assessment methods.

Table 1.
Characteristics, Interventions, and Cardiorespiratory Outcomes of the Included Studies

| Study | Study design | Sample | Yoga intervention | Frequency/duration | Comparator | Cardiorespiratory outcome /measurement | Baseline $VO_2max$ | Post-intervention $VO_2max$ | Effect | Statistical significance | Overall direction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tran et al., 2001 | Pre–post intervention | Sedentary young adults (n=10) | Hatha yoga | 4×/week; 8 weeks (~85 min/session) | NA | $VO_2max$; treadmill exercise with respiratory gas analysis | 32.3 mL/kg/min | 34.2 mL/kg/min | +1.9 mL/kg/min (+6%) | $p<0.01$ | Increase |
| Ramos-Jimenez et al., 2009 | Quasi-experimental | Physically active women (n=13) | Intensive Hatha yoga | 5×/week; 11 weeks (90 min/session) | NA | $VO_2max$; treadmill with gas analysis | 23–31 mL/kg/min | 27–32 mL/kg/min | +1 to +4 mL/kg/min | $p<0.05$ | Increase |
| Tracy & Hart, 2013 | Randomized controlled trial | Healthy young adults (n=21) | Bikram yoga | 3×/week; 8 weeks (24 sessions; 90 min/session) | Non-yoga control | $VO_2max$/maximal aerobic fitness; maximal treadmill test | NA | NA | No significant change | NS | Null |
| Lau et al., 2015 | Controlled trial | Adults (n=173) | Hatha yoga | 3×/week; 12 weeks | Wait-list control | $VO_2max$; Bruce treadmill test | Men: 32.99 | Men: 35.59 | +2.61 vs. +0.72 mL/kg/min in control | $p=0.007$ | Increase |
| Papp et al., 2016 | Randomized controlled trial | Healthy university students (n=44) | High-intensity Hatha yoga | 1×/week; 6 weeks (60min/session) | Control | Estimated $VO_2max$/cardiovascular fitness; Cooper test | NA | NA | No significant effect | NS | Null |
| Beutler et al., 2016a | Matched comparison / observational | Yoga practitioners (n=9) and controls (n=6) | Regular yoga practice | Habitual practice | Physically active matched control | Exercise capacity; cycling exercise test | NA | NA | Exercise endurance not superior | $p=0.273$ | Null |
| Udhan et al., 2018 | Pre–post intervention | Healthy adults (n=200) | Integrated yoga | 6×/week; 6 months (1h/session) | NA | Estimated $VO_2max$; Queen's College Step Test | 43.73 mL/kg/min | 50.04 mL/kg/min | +6.30 mL/kg/min | $p<0.0001$ | Increase |
| Gohel et al., 2021 | Pre–post intervention | Adults (n=50 analyzed) | Integrated yoga | 1 year; home + supervised practice | NA | $VO_2max$; Bruce treadmill test | 33.84 mL/kg/min | 43.64 mL/kg/min | +9.80 mL/kg/min | $p<0.001$ | Increase |
| Bandyopadhyay et al., 2022 | Acute comparative study | Physically active men (n=7) | Surya Namaskar | Acute single session | Bicycle ergometry | Acute cardiorespiratory response; portable metabolic cart | NA | NA | Acute physiological response assessed | NA | Acute response |
| Mittal et al., 2023 | Longitudinal study | Medical students (n=99) | Regular yoga practice | 6 months | Non-yoga group | $VO_2max$; treadmill/ergometer with metabolic analysis | Male: 2.64 L/min; Female: 1.51 L/min | Male: 2.81 L/min; Female: 1.69 L/min | +2.80 vs. +0.15 in control | Significant between-group difference | Increase |

| Study | Study design | Sample | Yoga intervention | Frequency/duration | Comparator | Cardiorespiratory outcome /measurement | Baseline $VO_2max$ | Post-intervention $VO_2max$ | Effect | Statistical significance | Overall direction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Kothari et al., 2023 | Cross-sectional comparative study | Medical students (n=60) | Yoga practice ≥6 months | ≥6 months | Untrained controls | Estimated $VO_2max$; modified Harvard Step Test | NA | NA | Higher aerobic capacity in yoga group | NA | Higher capacity |
| S. Y. Park & Yang, 2023 | Randomized controlled trial | Physically active adults (n=20) | High-intensity interval cardio yoga (HIICY) | 3×/week; 4 weeks (30 min/session) | Traditional interval Hatha yoga | $VO_2max$; treadmill with respiratory gas analysis | NA | NA | Significant increase; greater improvement than comparator | $p=0.0002$; $d=0.67$ | Increase |
| Kothari et al., 2024 | Pre–post intervention | Individuals with hypertension (n=250) | Yoga therapy / integrated yoga | 6 months | NA | $VO_2max$; metabolic module/PowerLab | Men: 23.1 mL/kg/min | 28.5 mL/kg/min | +5.4 mL/kg/min | $p=0.017$ | Increase |

Most studies used chronic or longitudinal interventions, with intervention durations ranging from 4 weeks to 1 year, while several studies employed randomized or controlled designs, cross-sectional comparisons, and one acute experimental approach. The study populations included sedentary young adults, physically active individuals, university and medical students, healthy adults, and individuals with hypertension, with sample sizes ranging from 7 to 250 participants.

The yoga interventions encompassed various modalities, including Hatha yoga, intensive Hatha yoga, Bikram yoga, integrated yoga, high-intensity Hatha yoga, HIICY, Surya Namaskar, and regular or therapeutic yoga practice. Cardiorespiratory fitness was primarily assessed using $VO_2max$ or estimated $VO_2max$, with measurement approaches ranging from treadmill or cycle-ergometer testing with respiratory gas analysis to step tests and field-based assessments. Overall, the majority of studies reported an improvement in $VO_2max$ or aerobic capacity following yoga practice, including studies evaluating Hatha, intensive Hatha, integrated yoga, and HIICY interventions. In contrast, Tracy and Hart, Papp et al., and Beutler et al. did not observe significant improvements in cardiorespiratory fitness. The magnitude of improvement also varied substantially across studies, with longer-duration interventions generally reporting more pronounced changes, although differences in study design, intervention intensity, and outcome assessment should be considered when interpreting these findings.

## DISCUSSION

### Yoga and Improvements in Aerobic Capacity: A Physiological Perspective

The principal finding of this literature review is that the majority of chronic intervention studies reported improvements in $VO_2max$ or aerobic capacity following yoga practice, although these findings were not consistent across all studies. From a physiological perspective, changes in $VO_2max$ can be understood within the framework of the Fick principle, whereby oxygen uptake is determined by the product of cardiac output and the systemic arterial–venous oxygen content difference (a–$vO_2$ difference) (Gifford et al., 2024; Mattavelli et al., 2023). Accordingly, improvements in $VO_2max$ may arise from enhanced central oxygen delivery through increased cardiac output, as well as from greater peripheral oxygen extraction and utilization. (Gifford et al., 2024).

In conventional aerobic exercise, increases in $VO_2max$ are primarily associated with enhanced maximal cardiac output, supported by increases in stroke volume, blood volume, ventricular filling, and skeletal muscle perfusion (Joyner & Dominelli, 2021). Peripheral adaptations, including enhanced muscle perfusion and oxygen utilization, also contribute to improvements in aerobic capacity (Furrer et al., 2023). Therefore, when yoga practice provides a sufficient and repeated physiological stimulus, improvements in $VO_2max$ may theoretically occur through adaptive pathways similar to those induced by other forms of physical training.

The findings from the reviewed studies provide support for this possibility. Improvements in $VO_2max$ were observed following several weeks to several months of Hatha, intensive Hatha, integrated yoga, and HIICY practice. However, the presence of several studies reporting null findings indicates that yoga practice does not invariably provide a sufficient stimulus to induce aerobic adaptations. This distinction is important because yoga encompasses a highly heterogeneous group of practices; some sessions are predominantly characterized by static postures, stretching, relaxation, and breathing exercises, whereas others involve repeated dynamic movements that impose greater metabolic demands (Batrakoulis, 2022). Taken together, the findings of this review support the concept that yoga may serve as a cardiorespiratory training stimulus when the characteristics of the practice generate a sufficient physiological load, rather than suggesting that all forms of yoga exert equivalent effects on aerobic capacity.

**Cardiovascular Mechanism and Autonomic Regulation**

One potential mechanism linking yoga practice to improvements in aerobic capacity is altered cardiovascular regulation. During physical activity, increased metabolic demand in working skeletal muscle is accompanied by an increase in cardiac output, mediated by adjustments in heart rate and stroke volume (Martinez et al., 2021; Nivethitha et al., 2021). With repeated exposure to an adequate training stimulus, chronic exercise may induce cardiovascular adaptations that enhance maximal cardiac output and thereby contribute to improvements in aerobic capacity (Heinonen, 2025). In aerobic training, key adaptations include increases in blood volume, ventricular filling, stroke volume, and maximal cardiac output capacity (Taylor et al., 2021).

Yoga has an additional characteristic in that it combines physical activity with breath regulation and relaxation. Several studies have suggested that yoga practice may influence cardiac autonomic regulation, including increases in heart rate variability (HRV) parameters and a tendency toward greater parasympathetic activity (Laborde et al., 2022; Neha Saboo & Sudhanshu Kacker, 2022). A review of yoga and HRV reported indications of increased HRV and vagal dominance across several yoga practices, although the authors also emphasized limitations in the quality of the available evidence (Giridharan et al., 2024; Sharma et al., 2025).

These autonomic adaptations may be relevant to cardiorespiratory fitness by facilitating more efficient heart rate regulation and post-exercise cardiovascular recovery (Souza et al., 2021). However, autonomic modulation should be distinguished from improvements in $VO_2max$. An increase in HRV or parasympathetic activity does not directly demonstrate an improvement in aerobic capacity (Grässler et al., 2021). Indeed, a meta-analysis of randomized controlled trials examining yoga and HRV found insufficient evidence to conclude that yoga consistently improves HRV compared with control conditions (Nalbant et al., 2022).

Accordingly, autonomic changes should be regarded as a potential mechanism supporting cardiovascular regulation rather than as direct evidence of improved aerobic capacity, as improvements in vagal-related HRV do not necessarily translate into significant improvements in maximal aerobic capacity (Manresa-Rocamora et al., 2021). The pranayama component may provide an additional physiological pathway. Slow, controlled breathing may influence the interaction between respiration and the autonomic nervous system, with evidence suggesting increased vagally mediated heart rate variability during and following slow-breathing practice (Laborde et al., 2022). A review of pranayama reported that slow-breathing techniques tend to produce more favorable effects on cardiovascular and autonomic variables than rapid-breathing techniques, although the specific mechanisms underlying individual breathing techniques remain incompletely understood(Pingali & Hunter, 2023). Other experimental studies have also demonstrated increases in RMSSD during paced breathing, consistent with enhanced vagal modulation (Sharpe et al., 2021). However, these mechanisms alone are insufficient to explain improvements in $VO_2max$ as a whole, because $VO_2max$ is also strongly determined by the capacity for oxygen transport and utilization during maximal exercise (Niemeyer et al., 2021).

**Peripheral Adaptations and the Role of Training Stimulus Magnitude**

Beyond central cardiovascular function, improvements in $VO_2max$ also depend on the capacity of peripheral tissues to utilize oxygen (Smith et al., 2023). Chronic aerobic exercise can enhance skeletal muscle perfusion and oxygen extraction capacity, thereby increasing the arterial–venous oxygen difference (a–$vO_2$ difference) (Mallett et al., 2025). Skeletal muscle adaptations, including increased oxidative capacity and microvascular perfusion, enable muscle tissue to utilize oxygen delivered by the cardiovascular system more effectively (Mølmen et al., 2025). In the context of yoga, this mechanism is particularly relevant because different yoga practices do not impose equivalent levels of muscle activation or metabolic demand (K. H. Lee et al., 2021). Dynamic yoga sequences performed continuously may engage multiple muscle groups and impose a greater metabolic stimulus, resulting in increased oxygen consumption and energy expenditure (Bandyopadhyay et al., 2022). In contrast, practices predominantly characterized by static postures or relaxation may generate a comparatively lower metabolic stimulus (Brinsley et al., 2022; K. H. Lee et al., 2021).

The findings from the acute Surya Namaskar study included in our data extraction can be considered within this context. The acute physiological response to this sequence of movements indicates that certain forms of yoga can indeed impose a measurable cardiorespiratory load (Bandyopadhyay et al., 2022). However, acute physiological responses should not be equated with chronic training adaptations. For improvements in $VO_2max$ to occur, such stimuli must be repeated with sufficient training exposure, including adequate intensity, frequency, and duration, to induce sustained physiological adaptations over time (Crowley et al., 2022; Franklin et al., 2022). This distinction may help explain the pattern observed in the present review. Studies involving relatively higher training frequencies—for example, three to six sessions per week—more frequently reported improvements in aerobic capacity, whereas one study involving a frequency of only once per week did not demonstrate a significant change. These findings support the importance of the cumulative training stimulus in determining cardiorespiratory adaptation. Interestingly, the study by Park and Yang demonstrated an increase in $VO_2max$ following HIICY, whereas another study employing high-intensity Hatha yoga did not observe a significant improvement (Papp et al., 2016; Park & Yang, 2023). This discrepancy suggests that the designation of an intervention as “high-intensity” alone may be insufficient to characterize its physiological training stimulus. Session duration, training frequency, continuity of movement, muscle groups recruited, and actual physiological intensity may be equally important determinants of the resulting cardiorespiratory stimulus.

**Explaining the Inconsistent Effects of Yoga on $VO_2max$**

The physiological mechanisms discussed above may also help explain why some studies included in this review demonstrated improvements in $VO_2max$, whereas others reported null findings. Improvements in $VO_2max$ require a training stimulus of sufficient magnitude to induce adaptations in both the central cardiovascular system and peripheral tissues (Atakan et al., 2021). When a yoga practice imposes a relatively low cardiorespiratory load, its physiological effects may be directed more toward flexibility, balance, mobility, or autonomic regulation than toward maximal aerobic capacity (Shin, 2021). In addition to intervention characteristics, baseline fitness may influence the magnitude of the observed response. Previously sedentary individuals may have a greater potential for physiological adaptation than individuals who are already physically active (Ardavani et al., 2021). This consideration is particularly relevant to the findings of Beutler et al., in which habitual yoga practitioners did not demonstrate superior exercise capacity compared with an actively exercising control group (Beutler et al., 2016). When yoga is compared with a no-exercise condition, improvements in $VO_2max$ may partly reflect the additional physiological stimulus provided by engaging in regular physical activity. Conversely, when yoga is compared with individuals who are already exposed to a structured exercise stimulus through other forms of physical activity, the between-group difference may be considerably attenuated (Jakicic et al., 2021).

These findings highlight the importance of the comparator when interpreting the effects of yoga on cardiorespiratory fitness. Yoga may confer benefits relative to a sedentary or no-exercise condition; however, this does not necessarily imply that it induces greater aerobic adaptations than established endurance activities such as running, cycling, swimming, or other forms of conventional aerobic exercise (Wibowo et al., 2022). Furthermore, the physiological effects of yoga are likely to be multidimensional. Asana may provide mechanical and metabolic stimuli, pranayama may influence respiratory patterns and autonomic regulation, while meditation and relaxation practices may modulate physiological responses to stress. Reviews examining yoga in the context of cardiovascular health have proposed several potential mechanisms, including autonomic modulation, reductions in oxidative stress and inflammation, and improvements in endothelial function (Murugesan, 2024). Nevertheless, these adaptations do not necessarily translate directly into improvements in $VO_2max$, which depend on the integrated capacity of the cardiovascular and peripheral systems to deliver, extract, and utilize oxygen.

Accordingly, improvements in overall cardiovascular health should not be equated with improvements in maximal aerobic capacity. An individual may derive meaningful benefits from yoga in terms of autonomic function, blood pressure regulation, vascular function, or stress modulation without necessarily experiencing a substantial increase in $VO_2max$ (Murugesan, 2024; Wagner, 2023). This distinction is important when interpreting the heterogeneous effects of yoga across different physiological outcomes and reinforces the need to consider $VO_2max$ as a specific marker of cardiorespiratory fitness rather than a comprehensive surrogate for cardiovascular health (LaMonte, 2022).

## CONCLUSION

Yoga may serve as a viable modality for improving cardiorespiratory fitness and $VO_2max$ when its practice provides a sufficient, sustained, and repeated physiological training stimulus. However, the available evidence does not support a uniform effect across yoga modalities. Instead, the observed variability in cardiorespiratory adaptation appears to be related to differences in training intensity, frequency, duration, and continuity of movement, suggesting that the magnitude and cumulative dose of physiological stimulus may be more important than the yoga modality itself. Cardiovascular, autonomic, respiratory, and peripheral adaptations may contribute to these responses, although current evidence remains insufficient to establish the relative contribution of individual mechanisms to $VO_2max$ improvement.

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