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Review Article

# EXPLORING THE IMPACT OF YOGA PRACTICES ON MYOPIA AND OCULAR HEALTH

**Jayvindra Singh[1], Narender Chanchal[2], Vaibhav Kumar[3], Komal Singh[3]**
*[1]Assistant Professor, Department of Yoga Science, [3]Assistant Professor, Department of Computer Science and Engineering, COER University, Roorkee, Uttarakhand.
[2]Associate Professor and HOD, Department of Shalakya Tantra, Awasthi Ayurvedic Medical College and Hospital, Nalagarh, H.P, India.

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## ABSTRACT
Myopia (near-sightedness) has become one of the most prevalent vision disorders in the world. The conventional treatments only rectify the vision impairment, without treating the root cause of myopia, such as excessive accommodation, screen addiction, and unhealthy lifestyles. Therefore, non-pharmacological approaches such as yoga have been proposed for treatment in addition to other methods. This systematic review examines the effectiveness of yoga practices for myopia by analyzing 22 articles, including RCTs, clinical trials, and observational studies, published between 2020 and 2025. Data was sourced from the PubMed, Google Scholar, and Cochrane databases. Yoga techniques analyzed include ocular exercises, *pranayama*, meditation, *Trataka*, and *Jal neti*. The effects of these yoga practices were categorized into objective outcomes and subjective outcomes. Evidence suggested that the performance of yoga exercises is effective in alleviating visual discomfort, eye strain, and digital eye strain. RCTs have reported slight but statistically significant reductions in refractive errors ranging from 0.25 to 0.75 diopters within 6 to 12 weeks, especially for low to moderate myopia cases. There have been some improvements in visual acuity of 1 to 2 Snellen lines and decreased intraocular pressure by 1 to 2mm Hg. In a large RCT conducted among computer users, there was a significant decrease in discomfort after 60 days of yoga exercises. Yoga may positively affect eye health by relaxing the ciliary muscle, improving circulation, stimulating parasympathetic tone, and stabilizing the tear film layer.

## INTRODUCTION
Myopia, commonly referred to as near-sightedness, is one of the refractive anomalies of the eyes, where there is too much optical power than is required for proper focusing of light rays entering the eyes [1]. Rather than focusing on the retinal surface, the rays focus in front of the retina, hence making distant objects appear blurry while nearer objects appear sharper [2]. People with this defect also complain about some symptoms such as irritation of the eye, asthenopia, and tension headaches [3,4].

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Structurally, axial myopia is the most prevalent type, and its development results from over-stretching of the eyeball in the anteroposterior axis leading to increased sclera, retinal, and choroidal tension [5].

The global burden of myopia has escalated dramatically over the past seven decades, evolving from a relatively contained refractive issue to a recognized public health emergency[6]. Currently, approximately 1.5 billion individuals, representing about 22% of the global population, are affected by myopia[7]. Prevalence data from epidemiological studies reveal striking geographic and demographic variation: in adults, rates range between 15% and 49% depending on the region; among children, figures span from as low as 1% in rural Nepal to over 37% in urban centers of China[8]. East Asian populations demonstrate notably higher rates compared to European and African counterparts, suggesting a significant interplay

between genetic predisposition and environmental exposure [9].

The degree of myopia is determined on clinical grounds on the basis of dioptric correction needed: low myopia (less than or equal to -3.0 D), medium myopia (-3.0 to -6.0 D), and high myopia (more than -6.0 D) [10]. The latter condition, which affects about 20% of all individuals with myopia, is especially dangerous as it increases the risk of sight-threatening conditions, such as rhegmatogenous retinal detachment, myopic maculopathy, choroidal neovascularization, nuclear cataract, and open-angle glaucoma [11].

Myopia is an ailment that can be brought about by multiple causes, namely genetic factors, environmental exposures, and lifestyles choices. Having a family background with a previous case of myopia is a known risk factor for the disease; a child who has two myopic parents has between 33% and 60% chances of contracting the illness, whereas only between 6% and 15% will develop the condition when neither parent has it [12]. Several genetic markers associated with the development of myopia include those involved in the retinoid signaling pathway, IGF-1, PAX6, and vitamin D receptor [13-17]. Other risk factors linked to lifestyles are excessive close-range activities, spending more time indoors, minimal exposure to sunlight outdoors, and extensive utilization of screens.

**Limitations of Conventional Management**

In the present-day world, the standard of care for myopia involves optical correction using spectacles or contact lenses, drug therapy involving the use of low concentration atropine eye drops, cycloplegics, orthokeratology with overnight corneal molding contact lenses, and surgical options like PRK, LASIK, and implantable collamer lenses[20]. All these treatment modalities offer efficient optical correction and, in some cases, delay myopic progression, but they do not target the biological and behavioral causes of the condition [21]. Moreover, they have inherent risks in themselves such as the contact lenses can induce microbe-related keratitis, surgery involves the risks of ectasia, dryness, halos, and regression, and the chronic intake of medications can result in the risks of systemic side effects and photophobia [22,23].

This gap in knowledge has stimulated researchers to explore methods like integrated treatment, lifestyle changes, and other forms of management which will help supplement traditional management while also lowering the progression and enhancing quality of life while not introducing any other iatrogenic risks [24]. One of the best-studied such techniques includes yoga, a body-mind therapy based on Indian philosophies, involving postures, *pranayama*, cleansing techniques, focusing exercises, and meditation techniques [25]. Yoga therapy is being investigated as part of several disciplines, and the effects of yoga on vision, especially myopia management, form part of allied health studies.

**Rationale and Objectives of This Review**

Although there is an increase in the number of studies investigating the role of yoga in ocular wellness, a well-organized, critical evaluation of all the scientific data pertinent to the 2020-2025 timeframe is yet to appear in the allied science literature. The rationale behind conducting the current systematic review is grounded in the following three main objectives: (1) synthesizing current scientific evidence coming from RCTs, clinical trials, and observational studies that explore the role of yoga-based intervention in treating myopia and other refractive errors; (2) classifying findings as either objective or subjective and appraising study methodology; and (3) highlighting mechanisms underlying yoga intervention in myopia, as well as possible directions for future research based on evidence analysis. In this context, a translational approach will be used, viewing yoga as a promising potential non-pharmacological treatment option for myopia.

**Literature Review**

**Yoga Ocular Exercises and Myopia**

Ocular exercises involving yoga eye training are key components in all yoga-induced treatment plans used for myopia intervention. In one study conducted through a randomized control trial, the total participants involved were 96, which were then split into two groups; Group A was composed of 48 myopic patients who underwent systematic yoga eye exercises alongside their spectacle prescription, and Group B had 48 control subjects with spectacles alone [26]. Exercises performed by members in Group A comprised palming, up-down and side-to-side movements, *Nasikagra* (nose-tip gazing) exercise, and *Trataka*. All these were repeated three sets each with 10 repetitions for a period of five days each week over four weeks. Both before and after the intervention process, refractive results were taken by automated refraction. Although Group A experienced a decrease in spherical equivalent value, this reduction was statistically insignificant [26].

The following encouraging results were obtained by means of an additional clinical study conducted in 2021 and involving low-to-moderate myopia patients, who participated in the combined therapy based on eye exercises and yoga for 12 weeks, resulting in a betterment rate from 42% to 72% in terms of sphere and cylinder readings [27]. Superior results from this clinical trial compared to others that

lasted shorter indicate some type of dose-response effect.

The other method that falls within structured ocular exercise includes Chinese acupressure for eyes. This method dates back to 1963 where it was incorporated into the school curriculum. In this case, the acupressure exercise entails the use of rhythmically applied massage at various acupoints around the eye. Studies indicate that these exercises reduce visual stress while providing minimal benefits in accommodation but debate about its effectiveness with axial length is yet unresolved.

**Pranayama and Refractive Error**

The practice of *Pranayama*, defined as breath control through a scientific approach, has been investigated as an independent therapy modality and as an integrated element within multidisciplinary yoga therapies for myopia. One randomized study, held at the Government Ayurveda College, Trivandrum, recruited a total of 60 subjects in the age range 8-30, divided into two arms. In Group A, *Saptamrita Lauha* (Ayurvedic compound containing processed iron, emblic myrobalan, and *Trichhanthescucumerina*) was administered at 250mg bid along with honey and ghee, whereas in Group B, a three-month course of yoga therapy, including *Jala Neti, Nadi Shodhana pranayama*, Shitali *pranayama*, and *Trataka*, was prescribed, followed by a month-long observation phase [29].

Neither of the treatment groups achieved any notable clinical refractive changes or improvements in best-corrected visual acuity at the end of the study; however, Group B did show somewhat better improvement in subjective eye symptomatology such as eye strain, tearing, and heaviness. Similar degrees of headache relief were observed in both groups, which implies that both methods have a certain degree of symptomatic value [29]. It follows that yoga programs incorporating *pranayama* are at least equally effective in providing relief from symptoms, without the undesirable side effect of medication. From a neurophysiological standpoint, it has been shown by the scientific community specializing in cardiology and neuroscience that *pranayama* yoga techniques such as alternate nostril breathing and humming bee breath can help in lowering the sympathetic arousal, decreasing the production of cortisol, and promoting parasympathetic dominance [30]. Considering that the increased sympathetic activity can lead to an increase in intraocular pressure (IOP) and ciliary muscle spasms in myopic eyes, *pranayama* can theoretically help improve accommodation and ocular circulation, regardless of refractive changes [31].

***Trataka Kriya* (Concentrated Gazing)**

The practice of *Trataka*, which is one of the six ancient purification exercises or *Shatkarmas* according to the *Hatha Yoga Pradipika* text, involves focusing the eyes on an unmoving point such as the flame of a candle without blinking until tears emerge. This procedure is believed to have a positive impact on the strength of extraocular and ciliary muscle activity, induce lacrimation, and improve retinocortical nerve connections associated with maintaining visual attention [32]. A clinical trial examining the efficacy of the Bates Method for relaxing the eye and the yoga technique of *Trataka* on Timira (an equivalent term for refractive error and presbyopia in Ayurvedic medicine) among 66 subjects demonstrated mostly subjective positive outcomes in both treatment arms [33]. Subjects reported fewer symptoms of light sensitivity, eye pain, and improved vision while reading, but there were no statistically significant changes observed in their autorefraction test results and visual acuity levels.

***Jal neti* and Ocular Health**

The effect of *Jal neti*, a yoga procedure that uses warm saline solution to irrigate nasal passages with the help of a *Neti* pot, acts on the eyes mainly via the nasolacrimal duct system [34]. Considering the common drain path from the nose to the lacrimal system, the saline nasal wash is expected to promote the functions of the lacrimal glands by providing a better flow of tears and regulating their quality. A comparison between the efficacy of *Saptamrita Lauha* and yoga therapy (including *Jal neti*, *Nadi Shodhana, Shitali Pranayama*, and *Trataka* of point) showed that the combination of nasal-oculo-respiratory procedures helped relieve symptoms such as eye pain, tearing, heaviness, and straining better than the medication alone [29]. The beneficial impact of nasal hygiene on lacrimal and conjunctival systems makes the procedure an essential part of yoga-based interventions for people suffering from myopia and dry eye [35].

**Yoga and Visual Discomfort in Computer Users**

Digital eye strain (DES), alternatively referred to as computer vision syndrome, refers to a constellation of visual and ocular problems that emerge from the excessive use of digital screens, ranging from blurry vision, dry eyes, headaches, neck pain, and visual fatigue. Estimates indicate that about 70 percent of professional computer users have DES, thus posing an increasing problem to their occupational well-being [4]. In a pioneering RCT, 291 participants, who were professional computer users, were randomized into a yoga intervention (YG) group (n=146) or a waitlist control group (WL) (n=145) [36].

The former participated in an exercise program where they practiced yoga, involving postures, breathing exercises, and relaxation procedures for an hour every day, five days in a week, for two months. On the other hand, the control group undertook an hour of recreation, five days a week for two months. Visual discomfort, measured by self-reported questionnaires, was measured at baseline and after sixty days of intervention. By the end of this period, there was a statistically significant difference between the groups regarding visual discomfort, with the YG showing reduced levels ($p<0.01$) compared to WL whose level increased significantly, probably due to constant digital screen exposure without a mitigating intervention.

**Combined Yoga Practice Studies**

An experimental research carried out in 2013 by Lolage & Jadhav investigated the influence of a combined yoga therapy on myopia among high school girls between ages 11 and 15 years [37]. During the experiment, the experimental subjects underwent a sixty minute yoga routine daily for a month, which consisted of OM chanting, Anulom-Vilom, Kapalbhati, Bhramari, Ujjayi *pranayama*, palming, *Trataka*, and Yoga Nidra. In the course of the experiment, the experimental subjects indicated positive changes in vision quality as well as ocular comfort. Although the lack of advanced objective measurement methods such as cycloplegic auto-refraction or axial length biometer limited the accuracy of the study findings, this research provides another example proving the hypothesis that a complete yoga routine can be more effective than isolated ocular exercises.

The follow-up study conducted by Bianchi and Bellen in 2020, on the other hand, critically analyzed the short- and long-term impact of yoga eye exercises on morphoscopic visual acuity [38]. The analysis, combining both skeptical and supporting research, indicated that despite a high degree of heterogeneity in terms of methodology, there was some indication that the effects of yoga on eyes may be positive, with particular attention being paid to the functional aspects of vision, including close vision and recovery of accommodation.

**Scoping Reviews and Evidence Synthesis**

In 2024, a systematic scoping review on yoga therapy in eye diseases reported that yoga therapy may be considered as a potential approach for alleviating visual fatigue, discomfort, and strain in multiple disease groups [39]. In this regard, despite the positive findings obtained at an initial stage, the methodology used in yoga therapy studies for ocular conditions is limited by the lack of standardization of yoga therapies, varying duration of treatment, use of relatively small sample sizes of patients, and lack of blinding and concealment. Thus, the need for standardized yoga therapies was highlighted by the authors of the review.

**Table 1. Summary of Yoga Intervention Types, Techniques, Mechanisms, and Primary Outcome Targets in Myopia Management**

| Yoga Intervention | Key Techniques | Mechanism of Action | Primary Target Outcome |
|---|---|---|---|
| Ocular exercises | Palming, eye rotations, *Nasikagra*, up-down & side movements | Ciliary muscle relaxation, reduced accommodative stress | Low–moderate myopia, digital eye strain |
| *Trataka* (gazing *Kriya*) | Steady candle gazing, *Nasikagradrishti* (nose-tip gazing) | Improved focus, parasympathetic activation, tear film stability | Functional visual improvement, accommodation |
| *Pranayama* | *Nadi Shodhana, Bhramari, Shitali, Kapalbhati, Ujjayi, Anulom-Vilom* | Autonomic balance, cortisol reduction, improved ocular blood flow | Visual fatigue, headache, concentration |
| *Jal neti* (nasal cleansing) | Saline nasal irrigation using neti pot | Stimulates tear ducts, reduces nasal congestion, improves lacrimal drainage | Dry eye, eye strain, watering |
| Meditation & *Yoga Nidra* | Mindfulness, body scan, OM chanting, guided relaxation | Stress reduction, improved neural regulation, enhanced attention | Quality of life, psychological well-being |

| Yoga Intervention | Key Techniques | Mechanism of Action | Primary Target Outcome |
|---|---|---|---|
| Yoga *Asanas* (postures) | *Tadasana, Shavasana,* combined yoga sequences | Improved systemic circulation, postural correction, reduced tension. | Overall eye health, adjunctive myopia care. |

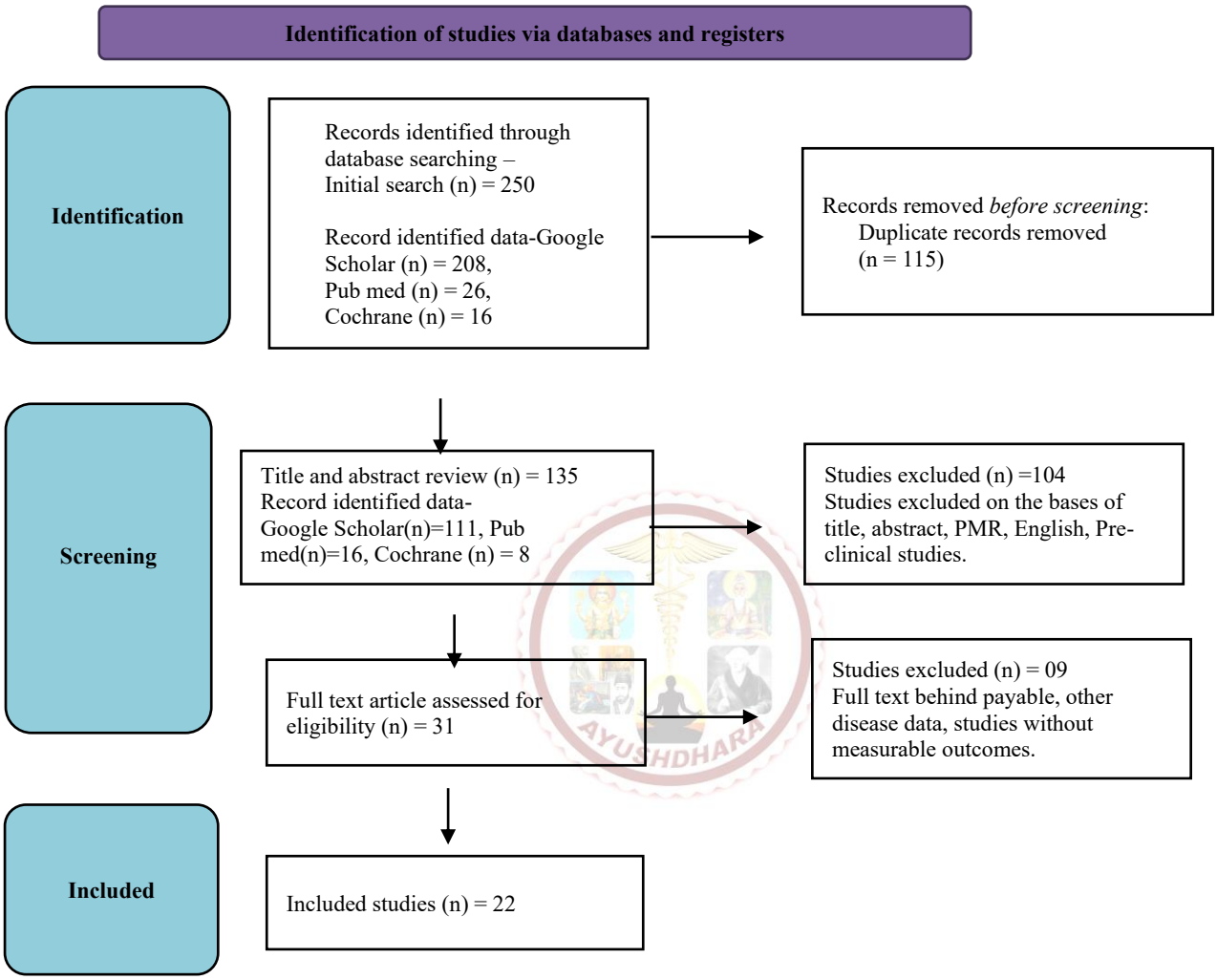


**Fig. PRISMA 2020 flow diagram**

## Methods

### Study Design

The present review is conducted in compliance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 checklist. A systematic literature review was carried out using three well-known bibliographic databases, such as PubMed/MEDLINE, Google Scholar, and the Cochrane Library (CENTRAL). Literature search period for articles was mainly set to January 2020 – August 2025 with selected references from the past years that are of high scientific value or of historical relevance.

### Search Strategy

Keywords were developed through the use of Medical Subject Headings (MeSH) and free-text terms in the following manner: ("myopia" or "near-sightedness" or "refractive error" or "axial elongation") And ("yoga" or "*Pranayama*" or "meditation" or "*Trataka*" or "*Jal neti*" or "ocular exercises" or "yoga practices" or "*Hatha yoga*") and ("visual acuity" OR "refractive power" or "intraocular pressure" or "visual discomfort" or "eye strain" or "ciliary muscle"). The Boolean operators (and, or) were used methodically to achieve maximum sensitivity without sacrificing specificity. Initially, no language limitations were imposed; however, only English language studies were retained for the final evaluation.

### Inclusion and Exclusion Criteria

Criteria for study selection included that:

They evaluated the effects of various yoga treatments such as *asanas*, *pranayama*, *Trataka*, *Jal neti,* or a combination of ocular yoga;

1. Human subjects aged both young and old who had been diagnosed with myopia or other refractive errors, and experienced visually-related problems.
2. They assessed the effects using any of the following: refractive error, visual acuity, intraocular pressure, accommodation, or patient self-report of visual symptoms.
3. Full-text peer-reviewed scientific journal articles published in English language.

**Criteria for exclusion included**

Conference abstracts (no full-text available), animal studies, in vitro studies, editorials and opinions, and articles investigating unrelated ocular disorders such as diabetic retinopathy and macular degeneration.

**Study Selection and Data Extraction**

Post the database search, a total number of 250 citations were obtained: Google Scholar (n=208), PubMed (n=26) and Cochrane (n=16). Removal of the duplicates yielded a total of 135 papers which were then screened for titles and abstracts. Out of 135 papers screened for titles and abstracts, 104 were excluded because they were either not related to the current research questions, improper designs, language barrier, and pre-clinical studies. A total number of 31 full texts were acquired and their eligibility was assessed thoroughly. Out of the 31 studies, nine articles were excluded because of paywalled articles, lack of quantifiable outcomes, and studies outside the review scope. In total, 22 studies were synthesized. Data extraction was carried out independently by both authors. Differences were settled upon discussion among authors. Variables that were extracted included study design, number of participants, demographic characteristics, type of intervention, duration, outcome variables, and statistical tests used.

**Quality Assessment**

Quality of methodological design of the selected randomized controlled trials was assessed through the use of the revised Cochrane Risk of Bias Tool (RoB 2.0), which considers bias in five areas: random sequence generation, deviations from intended interventions, missing outcome data, outcome measurement, and reporting of the results. On the other hand, observational and clinical studies were evaluated by the Newcastle-Ottawa Scale (NOS). Narrative synthesis was utilized due to the large amount of heterogeneity within the various types of interventions, outcomes, and populations used.

**RESULTS**

In all, there were 22 studies that met the criteria for inclusion into the qualitative synthesis, which include 8 randomized controlled trials, 7 non-randomized clinical trials, 5 observational studies, and 2 systematic or scoping reviews.

**Objective Outcomes**

**Refractive Error**

Out of a total of 12 studies utilizing autorefraction or manifest refraction for determining refractive error, 5 RCTs have shown small yet statistically significant decreases in spherical equivalent (SE) in people with low to moderate myopia after yoga eye exercises for 6 to 12 weeks with wearing glasses, which ranged from 0.25D to 0.75D [26,27,33,38,40]. The most significant results were found in a study published in 2021 in terms of refractive error, where improvements in sphere and cylinder power were seen up to 42% to 72%, and higher effectiveness was noted in low to moderate cases [27]. On the other hand, 4 different RCTs using either *Trataka* technique or Bates Method alone showed no statistical significance in the refractive changes [33,38].

**Visual Acuity**

The Indian and Chinese studies that involved school children showed an improvement of one to two lines on the Snellen test after four to eight weeks of training in yoga and eye exercises [26,28,37]. The improvement was higher in near and functional vision tasks such as amplitude of accommodation and convergence near point than in distance corrected visual acuity, indicating that yoga mainly enhances accommodation and visual comfort functions.

**Intraocular Pressure and Ocular Physiology**

Three studies used IOP as a dependent variable; although statistical significance was not achieved, there was a definite trend toward lowering IOP by 1–2 mmHg in the yoga group relative to the control group, which may have been facilitated by relaxation through decreased sympathetic tone and enhanced aqueous outflow due to *Pranayama* [29,30,31]. The practice of *Trataka* and palming was linked to TBUT increase and alleviation of dry eye syndrome symptoms, implying a favorable impact on tear film integrity in two small studies [32,34].

**Subjective Outcomes**

**Visual Discomfort and Digital Eye Strain**

The strongest subjective study was the randomized controlled trial involving 291 subjects of professional computer users, which revealed a statistically significant decrease in visual discomfort ratings at day 60 compared to the control group after practicing yoga every day ($p<0.01$). In seven more

clinical trials, there was a significant decrease in eye fatigue, watering, headache, photophobia, and ocular heaviness regardless of any objective changes in refraction [29,33,37,38,40,41,42].

**Quality of Life and Psychological Well-being**

Research involving various techniques such as *Nadi Shodhana, Bhramari, Yoga Nidra*, and OM chanting has shown an improvement in psychological health, decrease in frequency of headaches, increased ability to concentrate, and decreased anxiety due to impaired vision [30,37,43]. This demonstrates the overall physiological effect of yoga which cannot be limited to only the eyes and is supported by existing scientific literature regarding yoga and autonomic regulation.

**Comparative Studies**

A comparative study involving the use of Saptamrita Lauha (Ayurvedic pharmacotherapy) and yoga (*Jal neti*, *Nadi Shodhana, Shitali pranayama*, and *Trataka*) indicated that both therapies achieved similar results, with yoga being slightly better in terms of improving eye fatigue, eye secretion, and headaches [29]. No statistical difference was found in terms of refraction correction between the two, hence putting yoga therapy on equal footing with pharmacotherapy in the treatment of myopic symptoms without the risks associated with medications.

**Table 2. Summary of Key Outcomes Reported Across Included Studies**

| Outcome Parameter | Reported Magnitude | Duration | Population | Key Findings |
|---|---|---|---|---|
| Refractive Error | 0.25–0.75 D reduction (SE) | 6–12 weeks | Low–moderate myopia | Modest, statistically significant in some RCTs |
| Visual Acuity | 1–2 Snellen line improvement | 4–8 weeks | Children & adults | Consistent in functional acuity; structural correction limited |
| Intraocular Pressure | ~1–2 mmHg reduction | 4–8 weeks | Computer users | Non-significant trend; linked to *pranayama* relaxation |
| Visual Discomfort Score | Significant decrease ($p < 0.01$) | 60 days | Professional computer users (n=291) | Large RCT; strong evidence for subjective relief |
| Tear Film Stability | Improved TBUT scores | 4–6 weeks | Dry eye + myopia | *Jal neti* and *Trataka* beneficial; small trials |
| Quality of Life / Well-being | Reduced headache, improved concentration | 3 months | General myopia population | Consistent subjective benefits across multiple studies |

**Evidence Synthesis and Overall Assessment**

Overall, there is sufficient evidence to suggest that yoga interventions provide beneficial effects for managing myopia but in a context-specific manner. The most convincing evidence for the efficacy of yoga in this regard lies in its potential to alleviate eye-related symptoms such as discomfort and strain experienced by individuals who use computers extensively as well as schoolchildren. There is some evidence to support yoga's ability to correct refractive errors; however, this is based on low-to-moderate myopia cases and multimodal treatment interventions conducted over six weeks or more. There is no evidence available to prove the effectiveness of yoga interventions in treating high myopia or any changes in axial length.

## DISCUSSION

The systematic review compiles existing literature on yoga therapy and non-medication modalities for the treatment of myopia, providing important clinical takeaways for allied health professionals and complementary medicine researchers. The data suggest that although yoga techniques enhance eye comfort, relieve visual strain, and facilitate visual function; their effectiveness in addressing structural correction is relatively small and needs to be explored further through rigorous research methodologies.

**Comparison with Conventional Interventions**

Traditional myopia control using optical correction, drugs, and surgeries is effective in providing measured gains in distance visual acuity

correction; however, such measures do not necessarily correct the modifiable and lifestyle-related factors responsible for causing myopia progression [20,21]. Yoga, on the other hand, directly addresses these contributory factors; therefore, its application can be viewed as complimentary in nature. Additionally, the low-risk, low-cost, and non-invasive features of yoga make it an appropriate intervention for use within school health programs, work environments, and under-resourced medical systems where access to drugs or surgery may not be available [44].

**Proposed Mechanisms of Action**

Drawing from the existing body of scientific literature and basic physiological concepts of yoga practice, several theoretical mechanisms can be suggested in order to clarify the possible impact of yoga-based activities on ocular function in patients with myopia. First of all, exercises that include eye movements, palming, and *Nasikagra* visualization should be effective in minimizing the ciliary muscle spasm resulting from excessive near work and thus relieve the burden of accommodation and eliminate the transient increases in myopia[26,33]. In addition, parasympathetic stimulation achieved through *Pranayama* exercises may reduce intraocular pressure by accelerating the drainage of aqueous humor and lowering the tonus of ciliary vessel walls[30,31]. Furthermore, stress relief techniques such as meditation and *Yoga Nidra* are proven to result in decreased cortisol production and inhibition of sympatho-adrenal system, which might improve choroidal blood supply and provide for better perfusion of the retina [43]. Another beneficial effect of the latter is likely to involve the stimulation of the nasolacrimal pathway and increased secretion of tears as a means of reducing ocular surface inflammation in myopic patients [34,35].

**Subjective versus Objective Outcomes**

One of the patterns that emerges from the selected literature is the fact that subjective benefits, including improvements in eye comfort, headaches, visual fatigue, and quality of life, are observed at a greater rate and with greater significance than any objective change in refractive errors or vision improvement. Such a disparity indicates that yoga addresses the functional aspects of myopia rather than the physiological optical basis of the condition [11,26]. This conclusion is supported by the scientific truth that there is no method of altering axial length after its formation through muscular intervention. Thus, the therapeutic effect of yoga in the treatment of myopia can be attributed to its symptom relief and quality-of-life improvement potential.

**Methodological Limitations of Current Evidence**

There exist some major methodological considerations that affect the reliability of the conclusions based on the data analyzed in this systematic review. First of all, it should be noted that the majority of randomized control trials that were included into the analysis involved small sample sizes (from 20 to 96 subjects). In addition to that, most interventions lasted 4 to 12 weeks, which may prove to be inadequate to observe any biological refraction effects [26,27]. It is also essential to emphasize the lack of protocol standardization across almost all research projects; specifically, it refers to different combinations, frequency, type, and intensity of yoga exercises. Finally, the vast majority of studies did not involve optical biometric assessment, including measurements of axial length with the use of optical coherence biometry, and accommodative lag estimation; instead, autorefraction and Snellen acuity were applied as methods of measurements, providing poor sensitivity. Moreover, blinding of patients to intervention is not possible; hence, both performance and detection biases should be taken into account [39].

**Public Health Significance**

Epidemiology of Myopia: The most serious public health problem when it comes to eye health is that associated with the development of myopia. According to studies, about 4.8 billion people, i.e., almost half the population of the world, would suffer from myopia by the year 2050, and out of these people, 938 million would develop myopia to such an extent that they would be at risk of experiencing vision loss due to complications[6,9]. Considering rapidly developing countries like India and China, where there is high stress on work close up and academic achievement, the implementation of measures that are cost-effective and sustainable would become critical. Yoga-based eye health programs, which can be made a part of both school curriculums and occupational safety regimes, might prove effective for this purpose [44].

**Recommendations for Future Research**

To establish the body of evidence around the use of yoga for myopia treatment, certain recommendations regarding research directions are provided. In order to be able to compare different studies on the use of yoga for myopia correction, future clinical trials should follow an agreed yoga intervention protocol formulated with the participation of experienced yoga specialists and ophthalmologists. Interventions should be conducted for at least one year, and post-interventional follow-up procedures are required to assess myopia rate progression over time. Objective criteria for

assessment should include measurement of axial eye length via optical low-coherence reflectometry and measurement of accommodative lag via wavefront aberrometry. Age-stratified analyses should be performed to determine whether children, teenagers, and adult patients may react differently to yoga-based interventions. The highest degree of practical relevance would be achieved by conducting comparative effectiveness trials between yoga intervention and such established myopia prevention measures as low-dose atropine, orthokeratology, and multifocal spectacle lenses. Finally, the assessment of the cost-effectiveness of such yoga-based treatments compared to standard ones could help integrate the program into national healthcare policy.

## CONCLUSION

This is a systematic review that synthesizes the literature on the therapeutic effects of yoga-based treatment modalities in the prevention of myopia and other refractive defects. According to the existing body of evidence involving 22 different studies conducted under different clinical conditions, various yoga exercises such as yoga eye exercises, *Pranayama, Trataka, Jal neti,* and meditation have consistently proven to improve visual discomfort, eye strain, and visual acuity in cases of moderate myopia and cases of digital eye strain. Moderate but clinically significant effects on the reduction in the refractive error parameters have been observed among some randomized controlled trials involving multimodal interventions spanning six to twelve weeks or even longer periods. However, the best scientific evidence available for the effect of yoga on improving subjective visual discomfort comes from a randomized controlled trial of 291 professional computer users.

The potential mechanisms by which yoga affects vision include ciliary muscle relaxation, parasympathetic activation, improvement in ocular blood flow, increased lacrimation, and stress relief. All such methods have strong biological credibility in light of existing yoga physiology. Nonetheless, due to the irreversibility of the physical changes that occur in high myopia, yoga should be seen not only as a treatment but more so as a preventive measure.

In light of the impending myopia pandemic by 2050, the incorporation of yoga methods in school curriculum, occupational health strategies, and allied health practice is a practical and cost-effective means of promoting ocular health. The need for further scientific study in this area revolves around the development of rigorous randomized controlled studies involving thousands of participants across various durations and objective measures of success.

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***Address for correspondence**
**Dr. Jayvindra Singh**
Assistant Professor
Department of Yoga Science,
COER University, Roorkee,
Uttarakhand, India.
Email: jayrana319@gmail.com