

EFFECTS OF YOGIC PRACTICES ON MYOPIA IN SCHOOL GOING CHILDREN: A PILOT STUDY

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ABSTRACT

Background Myopia is a widespread issue in India, where uncorrected refractive errors are the primary cause of vision impairment. Non-pharmacological and non-surgical approaches, such as yoga, are being explored as complementary strategies to reduce symptoms associated with myopia.

Objective This pilot study aimed to evaluate the efficacy of yogic practices in alleviating myopia-related symptoms in children.

Methods Forty students (aged 10-19 years) from Shri Guru Ram Rai School, Dehradun, diagnosed with myopia (spherical equivalent ≤ -0.5 dioptre) were randomly assigned to a yoga protocol group. The intervention consisted of a 4-week structured yoga program (60 minutes daily), including cleansing techniques, asanas, pranayama, mudra and mantra along with specific yoga eye exercises. Symptom changes were measured through parent-reported questionnaires administered before and after the intervention. Paired-sample t-tests were used for statistical analysis.

Results Significant improvements were observed across all measured symptoms, with mean differences ranging from 0.60 to 0.90 (60%–90% improvement). The greatest improvements were in difficulty seeing distant objects (mean difference = 0.90, $t = 18.74$, $p < 0.001$), frequent blinking (mean difference = 0.85, $t = 14.22$, $p < 0.001$), and rubbing of eyes (mean difference = 0.85, $t = 14.22$, $p < 0.001$). Substantial reductions were also reported in discomfort, headaches, photophobia, and other related symptoms.

Conclusion A structured 4-week yoga program has shown relevant improvement in myopia-related symptoms in school-going children, suggesting its potential as a complementary therapy. Further large-scale randomized trials with objective measures are necessary to substantiate these findings and explore the sustained benefits of yoga in managing myopia. This study underscores the potential of yoga as an adjunctive approach to alleviate visual strain and associated discomfort in children with myopia.

Keywords- Pilot Study, Yoga Effect, Myopia Symptoms, School-Going Children, Eye health.

1. INTRODUCTION

Paediatric myopia is a significant concern worldwide, impacting around 23% of the global population, with reported prevalence rates ranging from 0.9% to 3.1%.¹ Myopia, also known as near-sightedness, is a vision disorder that enables clear close-up vision but impairs distance vision. The eye's irregular shape disrupts light focusing, leading to difficulty seeing distant objects clearly.² Visual acuity assesses the eye's ability to perceive fine details. Standardized charts with varying letter sizes help measure this capacity. The resulting score reflects the smallest details recognizable at a set distance. High contrast enhances measurement accuracy.³ The prevalence of myopia is remarkably high in Asian populations, with estimates indicating a range of 37% to 60%, underscoring the significance of this issue in the region.^{4,5} Globally, myopia is emerging as a major public health concern, especially among school-aged children due to increase near-work activities and reduced outdoor exposure (Holden et al., 2016). The increasing global prevalence of myopia poses a significant public health challenge. Severe myopia (≤ 6 D) is associated with a heightened risk of sight-threatening complications, including myopic macular degeneration, retinal detachment, glaucoma, and choroidal neovascularization.^{6, 7, 8} Ancient Indian yogic texts such as the *Hatha Yoga Pradipika* and *Gheranda Samhita* describes several eye exercises like *Trataka* (steady gazing), *Neti kriya* (nasal cleansing), and *Shambhavi mudra* which are believed to improve ocular health and concentration (Saraswati, 2009).⁹ These practices are aimed at strengthening the eye muscles, improving circulation, and enhancing mental focus, thereby potentially influencing visual health.

Symptoms of myopia

- Blurred vision when viewing distant objects (e.g., unable to read the classroom blackboard).
- Squinting or narrowing of the eyes to see clearly.
- Frequent eye rubbing or blinking.
- Eye strain and headaches after prolonged near work.
- Sitting too close to televisions or holding books close to the eyes.^{10, 11, 12}

Example: A school child with myopia may consistently sit in the front row to clearly see the teacher's writing on the blackboard.

2. METHODOLOGY

This pilot study was conducted on May 2024 with 40 school-going children (both boys and girls) of Shri Guru Ram Rai School, S.D. Road, Dehradun, India, who showed symptoms of myopia and had undergone frequent eye tests. Participation was voluntary, and consent was obtained from their parents who were interested in involving their children in the yoga program.

Data Collection

Pre-test: Parents provided symptom details before the program.

Post-test: After 4 weeks, symptom changes were re-evaluated.

Inclusion Criteria

Children aged between 10–19 years.

Students showing recurrent symptoms of myopia.

Willingness to participate in the intervention.

Intervention Design The study involved a 4-week structured yoga program of 60 minutes daily with 40 students (fig.1 & 2), focusing on yogic practices considered beneficial for eye health.

Fig. 1 Students performing Shambhavi Mudra



Fig.2 Students performing Jal-neti kriya



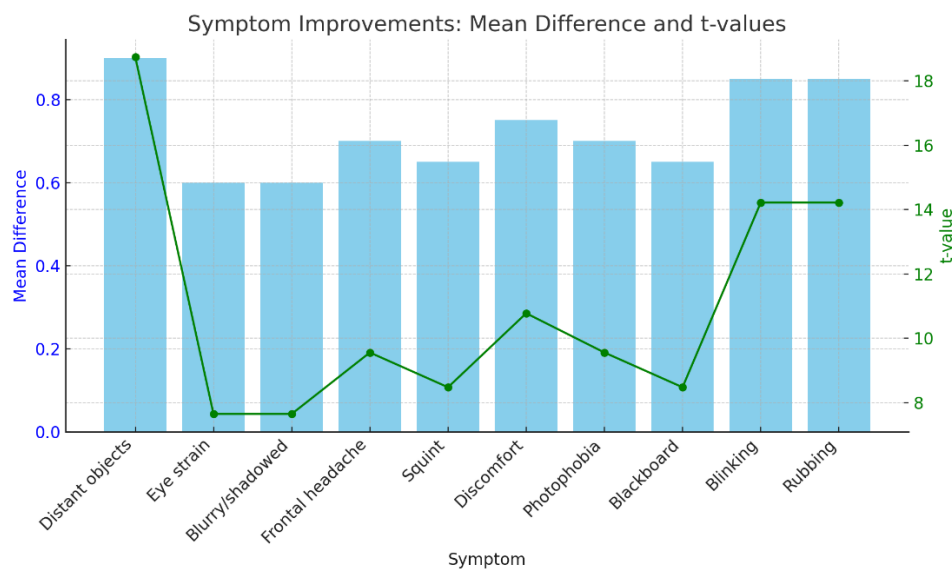
Table 1. Yoga Intervention Schedule

Component	Practices Included	Duration (minutes)	Frequency
Prayer	Mahamrityunjaya Mantra	3	Daily
Shatkarma (Cleansing techniques)	Jal Neti, Rubber Neti, Trataka	20	Daily
Asanas (Postures)	Surya Namaskar, Tree Pose, Rabbit Pose, Cat-Cow, Corpse Pose	10	Daily
Pranayama (Breathing)	Nadi Shodhana	5	Daily
Mudra	Shambhavi Mudra	5	Daily
Mantra	Chakshushi Mantra	15	Daily
Closing Prayer	Shanti Path	2	Daily
Total Session Duration	—	60 minutes	Daily

Table 2. Paired Sample t-Test Results

Question	Mean Difference	Std Dev of Difference	t-value	df	p-value
Distant objects	0.90	0.30	18.74	39	0.0000
Eye strain	0.60	0.49	7.65	39	0.0000
Blurry/shadowed	0.60	0.49	7.65	39	0.0000
Frontal headache	0.70	0.46	9.56	39	0.0000
Squint	0.65	0.48	8.48	39	0.0000
Discomfort	0.75	0.44	10.78	39	0.0000
Photophobia	0.70	0.46	9.56	39	0.0000
Blackboard	0.65	0.48	8.48	39	0.0000
Blinking	0.85	0.36	14.22	39	0.0000
Rubbing	0.85	0.36	14.22	39	0.0000

Interpretation The intervention led to highly significant and consistent improvements across all measured symptoms of myopia. The results strongly support the effectiveness of the intervention in reducing both visual and discomfort-related symptoms in the sample group.



Interpretation The graph presents a dual perspective, with blue bars indicating the mean differences in symptoms and a green line showing the t-values. This side-by-side representation enables a direct comparison of the extent of improvement and the statistical strength of the findings for each symptom.

3. RESULTS

The study involved 40 students from Sri Guru Ram Rai School, Sahastradhara Road, Dehradun, Uttarakhand, who completed a 10-item visual symptom questionnaire before and after a targeted intervention. Each symptom was assessed using binary responses (Yes = 1, No = 0).

Key Findings:

Pre-intervention: 100% of students reported experiencing all 10 symptoms.

Post-intervention: Significant improvement was observed across all symptoms.

Most improved symptoms: Distant object, Blinking, Rubbing, Discomfort and Frontal Headache.

The table shows the mean differences, standard deviations of differences, and t-test results for various myopia-related symptoms before and after intervention ($n = 40$, $df = 39$).

1. Statistical Significance

For all symptoms, the p -value = 0.0000 (< 0.05), indicating that the changes observed are highly statistically significant. This means the intervention had a measurable effect in improving symptoms.

2. Magnitude of Change

The mean differences range from 0.60 to 0.90, suggesting a moderate to high improvement in symptom scores. The largest improvements were seen in Distant objects (0.90) indicating much clearer distance vision. Blinking (0.85) and Rubbing (0.85) indicating improvement in eye discomfort behaviours.

3. t-values and Effect Strength

All t-values are very high (7.65 – 18.74), much greater than the critical value (≈ 2.02 at $df=39$, $p<0.05$). This suggests the differences are not due to chance and reflect a strong effect of the intervention.

4. Symptom-Specific Improvements

Visual clarity symptoms (Distant objects, Blurry/shadowed, Blackboard difficulty) improved significantly, indicating better visual function.

Discomfort-related symptoms (Eye strain, Frontal headache, Discomfort, Photophobia) showed marked reduction, suggesting improvement in visual fatigue.

Behavioural indicators (Blinking, Rubbing, Squinting) also improved, supporting the subjective findings.

4. DISCUSSION

This pilot study suggests that yogic practices may have a positive influence on managing symptoms of myopia in school-going children. Ancient yogic techniques such as Shatkarma, Asanas, Pranayam, Mudra and Mantra are believed to enhance ocular muscle strength and relaxation, potentially contributing to visual improvement. Previous studies have also reported that yoga and eye exercises can reduce ocular strain, improve accommodation, and enhance blood circulation to ocular tissues (Nagendra & Nagarathna, 2014; Reddy et al., 2018). The results highlight that about one-third of children showed complete recovery, while nearly half showed partial improvement. This indicates that yoga may serve as a supportive, non-invasive approach alongside routine eye care. However, about one-fourth of participants showed no change, suggesting that the effect of yoga may vary depending on individual ocular health, severity of refractive error, and compliance with the program.

Implications for Future Research

The promising results of this pilot study provide a strong foundation for further investigation into the effects of yoga on myopia-related symptoms. Given the significant improvements observed within a 4-week period, it is reasonable to hypothesize that a longer intervention period, such as 90 days, could lead to even more

pronounced benefits. Future studies with extended durations and larger sample sizes could provide more definitive insights into the potential of yoga as a complementary therapy for myopia management. Further large-scale and long-term studies are recommended to validate these preliminary findings.

5. CONCLUSION

The intervention led to a statistically significant improvement in visual symptoms among students. The consistent improvement across all categories especially in distant vision, blinking, rubbing suggests that the program was effective in improving visual fatigue and discomfort. These results highlight the importance of regular visual health assessments and proactive measures in school environments. According to these yogic practices can be considered a complementary approach for managing visual health. While not a replacement for conventional ophthalmic treatment, yoga offers a holistic, cost-effective, and culturally rooted intervention that may enhance children's eye health and overall well-being.

Continued monitoring, improved classroom ergonomics, and awareness programs are recommended to sustain and enhance these outcomes.

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