RESEARCH PAPER

To Study The Clinical Efficacy Of Madhuvara Ghrita In Timir With The Help Of Nasya And Tarpan And Its Abhyantar Prayog W.S.R. To Simple Myopia

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ABSTRACT

Simple myopia is a common refractive disorder that frequently begins during school age and may progress through adolescence. The source thesis evaluated an Ayurvedic medicated ghee, Madhuvara Ghrita, administered through Nasya and Tarpana, with or without continuous oral administration (Abhyantara Prayoga), in patients clinically diagnosed with Timira with special reference to simple myopia. To convert the thesis dataset into a structured journal-style report, critically contextualize the findings against contemporary myopia science, and distinguish observed outcomes from mechanistic hypotheses. Sixty participants aged 10–40 years with simple myopia up to −6.00 D were allocated to two active-treatment groups (30 participants each). Group I received Madhuvara Ghrita by Nasya and Tarpana in alternating 7-day cycles for 3 months. Group II received the same local regimen plus Madhuvara Ghrita 10 mL orally twice daily for 3 months. Visual acuity and clinical refraction were the principal reported efficacy outcomes; follow-up observations extended to 6 months. The thesis reported paired Student's t tests for within-group comparisons.

Results: In Group I, the mean visual-acuity score increased from 57.33 to 64.00 in right eyes and from 59.67 to 66.00 in left eyes (reported $P<0.01$). In Group II, corresponding values increased from 56.67 to

65.33 and from 55.67 to 65.67 (reported P<0.001). Mean clinical refraction changed from −1.75 to −1.67 D and −1.73 to −1.65 D in Group I, and from −1.79 to −1.66 D and −1.80 to −1.67 D in Group II. Fourteen of 60 participants (23.33%) were classified as having improved vision with reduced spectacle power, including 6/30 in Group I and 8/30 in Group II; the remaining 46 participants were classified as improved/stable without reduction in spectacle power. No adverse reactions were reported.

The thesis dataset describes improvement in visual-acuity scores in both active-treatment groups and small shifts in reported mean clinical refraction, with numerically greater change in the group receiving additional oral therapy. However, absence of a placebo/standard-care comparator, uncertain allocation procedures, lack of a formal between-group test, use of non-cycloplegic/insufficiently specified refractive outcomes, and internal inconsistencies in reported summary statistics preclude causal conclusions regarding myopia control. A rigorously designed randomized controlled trial using cycloplegic spherical equivalent and axial length as primary outcomes is required before Madhuvara Ghrita can be considered an evidence-based myopia-control intervention.

Keywords: Timira; simple myopia; Madhuvara Ghrita; Nasya; Tarpana; Abhyantara Prayoga; Ayurveda; refractive error; clinical study

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1. Introduction

Myopia is a refractive state in which parallel rays from a distant target are focused anterior to the retina when accommodation is relaxed. In routine practice it is corrected with minus-powered spectacles or contact lenses, but the clinical importance of myopia extends beyond optical blur because greater myopic refractive error and axial elongation are associated with increasing lifetime risk of sight-threatening retinal and macular disease. Global modeling has projected a substantial rise in the number of people affected by myopia and high myopia during the first half of the twenty-first century [9]. Indian school-based data also demonstrate that myopia is an important and evolving public-health problem. In the North India Myopia Study, urban schoolchildren in Delhi showed measurable prevalence and one-year incidence/progression, while a large South Indian school cohort reported myopia in 17.5% of screened children, with prevalence increasing with age [10–12].

The development and progression of juvenile myopia are multifactorial. Genetic susceptibility is well established, but environmental exposures modify risk. Genome-wide association analyses implicate pathways involving extracellular-matrix remodeling, the visual cycle, neuronal signaling and ocular growth [13]. Epidemiologic work in children has associated parental myopia, near-work patterns and outdoor exposure with myopic status [14]. Randomized school-based studies have provided stronger evidence that increased outdoor time can reduce incident myopia, supporting an environmental component that is amenable to intervention [15–17]. These observations have changed the modern goal from merely correcting refractive blur to slowing progression in at-risk children.

Contemporary myopia control is increasingly evaluated with cycloplegic spherical equivalent refraction and axial length, because these outcomes are less susceptible than unaided visual acuity to learning effects, variable accommodation and day-to-day testing conditions. Pharmacologic trials of low-concentration atropine have shown dose-dependent effects on refractive progression and axial elongation, although responses vary by concentration, age and population [18–22]. Optical approaches have also evolved. Defocus Incorporated Multiple Segments (DIMS) spectacles, highly aspherical lenslet spectacles, dual-focus soft contact lenses and orthokeratology have each demonstrated reduced refractive progression and/or axial elongation in randomized trials [23–27]. Combination strategies such as orthokeratology plus low-dose atropine have also been studied [28]. Earlier progressive-addition spectacle studies produced smaller effects, illustrating that not every plausible optical intervention yields clinically meaningful control [29].

Ayurveda conceptualizes ocular disease within Shalakya Tantra. The source thesis situates defective distance vision within the broader classical description of Drishtigata Roga and particularly Timira, while acknowledging that refractive error does not have an exact one-to-one classical equivalent. Sushruta describes Timira among disorders affecting vision and discusses ocular therapies including local procedures, whereas Vagbhata and other classical authors provide related descriptions of Timira, Kacha and Linganasha [1–3]. Kriyakalpa procedures such as Tarpana are traditionally used for ocular conditions, and Nasya is described within broader therapeutic frameworks. The thesis selected Chakshushya drugs from Ayurvedic materia medica and formulated them in ghrita, using principles described in Bhavaprakasha, Sharangadhara Samhita and Dravyaguna texts [4–8].

Madhuvara Ghrita, as used in the thesis, is not presented as a directly quoted classical proprietary formula. It was prepared as a compound medicated ghee containing Yashtimadhu (Glycyrrhiza glabra), Shatavari (Asparagus racemosus), Haritaki (Terminalia chebula), Bibhitaki (Terminalia bellirica), Aamalaki (Phyllanthus emblica/Emblica officinalis) and cow ghee. The formulation was chosen on the basis of traditional Chakshushya, Rasayana and Dosha-modulating attributes. Experimental research on Triphala-related preparations has demonstrated antioxidant and retinal effects in non-myopic animal models, but such evidence is indirect and cannot establish an effect on human refractive development [30].

The source thesis compared two active regimens: Nasya plus Tarpana versus the same local regimen with continuous oral Madhuvara Ghrita. Because the work predates many current standards of myopia-control trials and because several statistical fields are internally inconsistent, direct conversion into a modern paper requires methodological transparency. The purpose of this manuscript is therefore twofold: first, to report the thesis-derived clinical data faithfully; and second, to interpret those findings according to current standards for refractive-error research without converting speculative mechanisms into established facts. The primary question is whether the reported outcomes show a consistent signal of change after therapy and whether addition of Abhyantara Prayoga appears numerically associated with greater change. The manuscript does not claim that the available

dataset proves slowing of axial myopia progression.

2. Literature Review

2.1 Modern concept of simple myopia

Simple or school-age myopia commonly emerges in childhood or adolescence and is usually dominated by excessive axial length relative to the optical power of the cornea and crystalline lens. Although corneal curvature, lens power and anterior-chamber depth contribute to refraction, longitudinal axial elongation is a central structural feature of progressive childhood myopia. This distinction matters clinically: a transient improvement in unaided visual acuity or a small change in manifest refraction does not necessarily demonstrate reduced axial growth. Modern trials therefore emphasize repeated cycloplegic refraction and optical biometry.

The epidemiology is heterogeneous across geography, ethnicity, urbanization and educational exposure. Holden and colleagues modeled a marked increase in global myopia and high myopia by 2050 [9]. In India, Saxena and colleagues reported myopia and associated risk factors among urban schoolchildren in Delhi [10], and subsequent follow-up of the cohort quantified incident and progressive cases [11]. In Tamil Nadu, Gopalakrishnan and colleagues screened more than 14,000 children and found 17.5% myopia under their study definition, with older age and urban school location associated with higher odds [12]. These studies differ in sampling and refractive definitions, but collectively they establish that childhood myopia is not a rare problem in India.

Genetic studies reinforce that refractive development is biologically complex. Kiefer and colleagues identified multiple loci associated with age at onset of myopia and highlighted pathways involving extracellular matrix, retinal signaling and visual-cycle biology [13]. Such findings are important when considering any proposed therapy, because a credible disease-modifying effect would need to influence a network governing ocular growth rather than simply improve subjective clarity. Family history and behavior interact: preschool data from Singapore associated myopia with parental history and environmental exposures [14]. Outdoor-time research is particularly informative because randomized studies can test causality more directly than cross-sectional associations. Rose et al. showed a protective association of outdoor activity [15], while He et al. demonstrated that adding outdoor activity at school reduced incident myopia over three years [16]. Wu et al. further investigated school-based outdoor exposure and light intensity [17].

2.2 Current evidence-based strategies for myopia control

Modern interventions can be grouped into pharmacologic, spectacle-based and contact-lens-based approaches. Low-concentration atropine has one of the largest randomized evidence bases. The LAMP trial compared 0.05%, 0.025% and 0.01% atropine with placebo and demonstrated concentration-dependent effects during the first year [18]. The two-year extension supported sustained benefit, particularly with 0.05% atropine [19], and the five-year report provided longer-term information on continued treatment, cessation and re-treatment [20]. LAMP2 addressed prevention of incident myopia in premyopic children rather than progression in already myopic children [21]. Importantly, results are not identical in every population; a US randomized trial of 0.01% atropine did not reproduce the magnitude of effect seen in several Asian studies

[22]. This variation underscores why local randomized evidence is required before generalizing any treatment.

Optical myopia-control strategies deliberately manipulate peripheral or simultaneous defocus while preserving central vision. The DIMS randomized trial demonstrated slower refractive progression and axial elongation over two years than single-vision spectacles [23]. Spectacle lenses with highly aspherical lenslets have likewise reduced progression compared with single-vision lenses in randomized studies [24]. The MiSight trial showed that a dual-focus daily disposable soft contact lens slowed progression across three years [25]. Orthokeratology trials, including ROMIO and the Danish CONTROL study, have demonstrated reduced axial elongation compared with controls, although patient selection, corneal health and adherence are important [26,27]. Kinoshita and colleagues reported an additive effect when low-dose atropine was combined with orthokeratology during the first year [28]. In contrast, the COMET progressive-addition lens study produced a statistically detectable but relatively modest average treatment effect [29].

These trials provide a benchmark for interpreting the thesis. They typically prespecify a refractive endpoint, use cycloplegia, measure axial length, include a parallel comparator and analyze between-group differences with methods that respect the randomized unit. The thesis used visual-acuity scores and spectacle dioptric power as main outcomes and reported paired within-group t tests. The evidence generated is therefore best treated as exploratory clinical data rather than as proof of myopia control.

2.3 Ayurvedic concept of Timira and therapeutic rationale

The thesis reviews Netra Sharira, Drishti and the classical classification of ocular disease in detail. Sushruta places considerable emphasis on diseases of the eye and describes Drishtigata disorders that can cause partial or complete visual impairment [1]. The thesis correlates a subset of Timira manifestations—particularly Avyakta Darshana or indistinct distance vision—with simple myopia while explicitly recognizing that the modern entity of refractive error does not have an exact classical counterpart. This is the most defensible interpretive approach: Timira is retained as the Ayurvedic diagnostic framework, whereas simple myopia supplies the modern refractive phenotype.

Classical management of Timira includes systemic and local measures. Nasya is traditionally administered through the nasal route and is used in disorders of the head and sense organs within Ayurvedic practice [2,3]. Tarpana is an ocular Snehana/Kriyakalpa procedure in which medicated ghee is retained over the open eye for a prescribed period using a boundary constructed around the orbit. Classical literature also describes Putapaka, Anjana, Aschyotana, Seka and related ocular procedures [1–3]. The thesis uses Tarpana and Nasya in alternating seven-day cycles and tests whether adding oral ghrita produces a larger clinical effect.

The selected ingredients have established identities in Ayurvedic materia medica. Yashtimadhu is described as Madhura, soothing and Rasayana in traditional sources; Shatavari is also characterized by nourishing and Rasayana attributes; Triphala combines Haritaki, Bibhitaki and Aamalaki and is widely described in classical texts [4,6–8]. The thesis interprets the combined formulation as predominantly Madhura, Snigdha

and Tridosha-modulating. Such traditional properties explain formulation selection but should not be equated with a molecular mechanism of refractive control. The ghrita vehicle may prolong ocular surface contact during Tarpana and facilitates administration of lipid-soluble constituents, but the extent to which any component reaches posterior ocular tissues after Tarpana or Nasya was not measured.

2.4 Pharmacological plausibility and the boundary between plausibility and proof

The thesis proposes several possible mechanisms, including transcorneal penetration, alteration in corneal curvature, nutritional support, antioxidant action and effects on ocular tissues. These ideas are hypothesis-generating. A medicated lipid placed on the ocular surface can interact with the tear film and corneal epithelium, but a clinically meaningful change in axial length, scleral remodeling or retinal signaling cannot be inferred from exposure alone. Likewise, subjective relief of eye strain or improvement in Snellen performance can arise without an anatomical change in myopia.

Experimental Triphala research offers a limited biological bridge. Suryavanshi et al. reported retinal effects of Triphala churna in a diabetic-rat retinopathy model [30]. That study supports the existence of bioactive antioxidant pathways relevant to retinal injury, but the disease, species, outcome and formulation differ fundamentally from simple human myopia. It therefore cannot be used as evidence that Triphala or Madhuvara Ghrita slows axial elongation. This distinction is essential for a publication-grade interpretation: traditional rationale and preclinical plausibility justify further testing, whereas therapeutic efficacy must be established by controlled clinical outcomes.

3. Materials and Methods

3.1 Study design and source

This manuscript is a structured secondary reporting of the clinical dataset contained in the uploaded thesis. The thesis describes the work as an open comparative clinical study conducted in the Shalakya Tantra outpatient and inpatient setting. It reports ethical-committee clearance and written informed consent. Sixty patients with simple myopia completed treatment and follow-up sufficiently for inclusion in the reported analyses. The document contains a local textual inconsistency in which one paragraph labels 15 participants in each group, but the sampling description, demographic tables, efficacy tables and overall-response table consistently show 30 participants per group. Accordingly, this manuscript reports n=30 per group and flags the discrepancy as a source-document limitation rather than silently correcting the original text.

3.2 Eligibility

Participants of either sex aged 10–40 years were eligible when they had diminished distance vision corresponding clinically to Timira/simple myopia and myopia up to −6.00 D. The source excluded pathological myopia; myopia greater than −6.00 D; cataract and postoperative cataract; inflammatory ocular disease; traumatic ocular injury; ocular disease other than simple myopia; diabetes mellitus; HIV; and age below 10 or above 40 years. These criteria were intended to produce a sample with uncomplicated simple myopia rather than degenerative or secondary refractive disease.

3.3 Clinical examination

The thesis describes detailed history taking, general and systemic examination and ophthalmic assessment using a case-record form. Reported ocular assessments included Snellen visual acuity, retinoscopy/refraction, tonometry,

keratometry and fundoscopy. Fundus examination was performed by direct ophthalmoscopy after pupillary dilation when appropriate. Axial length measurement is listed among the assessment methods, and the thesis states that keratometry and axial length were to be measured at baseline, three months and six months. However, no analyzable aggregate axial-length or keratometry outcome table was identified in the reported results available for this manuscript; therefore, no numerical change in axial length or keratometry is presented here.

3.4 Study drug

Madhuvara Ghrita comprised Yashtimadhu (Glycyrrhiza glabra root), Shatavari (Asparagus racemosus root), Haritaki (Terminalia chebula fruit), Bibhitaki (Terminalia bellirica fruit), Aamalaki (Phyllanthus emblica/Emblica officinalis fruit) and cow ghee. Raw botanical materials were reportedly obtained locally, authenticated by experts in the Dravyaguna department, and the medicated ghrita was prepared in the Rasa Shastra department. The thesis states that drug standardization was performed at Shree Dhootpapeshwar Limited.

Preparation followed a ghrita-siddhi approach referenced to Sharangadhara Samhita [5]. The five herbal ingredients constituted the Kalka component in equal fractional contributions to one part total Kalka; cow ghee was used at four parts and decoction of the same herbal drugs at sixteen parts. The mixture was heated and reduced according to the described sneha-paka method until the medicated ghrita was obtained. This formulation is best described as a study-specific compound based on classical ingredient properties rather than a directly quoted classical proprietary formulation.

3.5 Treatment groups

Group I (Nasya + Tarpana; n=30): Madhuvara Ghrita was administered as Nasya at four drops in each nostril in the morning for seven consecutive days. This was followed by a seven-day Tarpana course, after which Nasya and Tarpana were alternated. Six treatment cycles were described across three months. During Tarpana, ghrita was retained over the eye until the eyelashes were immersed. The thesis lists a retention schedule of 100–400 matra, increasing by 50 matra per day.

Group II (Nasya + Tarpana + Abhyantara Prayoga; n=30): participants received the same alternating Nasya/Tarpana regimen and, in addition, ingested Madhuvara Ghrita 10 mL twice daily, morning and evening, continuously for three months. Participants were allowed to continue routine activities and to use their existing spectacle correction during therapy.

3.6 Follow-up and outcomes

Treatment was delivered during months 0–3. The thesis reports four observations during the first month at seven-day intervals, two observations during the second month at fifteen-day intervals, and monthly observations from months three through six. The principal efficacy variables used in the reported statistical tables were visual-acuity score and clinical refraction/spectacle power.

For visual acuity, Snellen fractions were converted to a numerical percentage-like scale attributed in the thesis to a conventional method: 6/6=100, 6/9=90, 6/12=80, 6/18=60, 6/24=50, 6/36=40 and 6/60=20. The thesis uses these scores to calculate group means. It separately reports a “percentage improvement” in Tables 13–16; because those percentages do not equal the relative change between the reported before- and after-treatment means, this manuscript

retains them only as "reported improvement percentages" and does not reinterpret them as mathematical percent change.

Clinical refraction was defined as the dioptric power required for full optical correction. Overall clinical response was categorized as: (i) myopia decreased/excellent—visual improvement with reduction in spectacle power; (ii) myopia stable/good—visual improvement without reduction in spectacle power; or (iii) myopia increased/bad—reduced visual acuity with increased spectacle power.

3.7 Statistical reporting

The source thesis states that paired Student's t tests were used for before–after comparisons and that GraphPad Prism was used for analysis. Mean, variability measures, t statistics and P values are reproduced as reported. No raw paired participant-level dataset was available for independent reanalysis, and no formal between-group hypothesis test was provided in the thesis. Consequently, this paper does not calculate new P values from summary statistics or infer statistical superiority of Group II over Group I. Where internal inconsistencies exist—for example, standard errors that are not numerically compatible with the reported standard deviations and sample size, and a t statistic/P-value combination that appears discordant—the values are reported with a caution rather than altered.

3.8 Research-integrity approach for the present manuscript

The present manuscript separates three evidence layers: (1) participant characteristics and treatment outcomes directly reported in the thesis; (2) traditional Ayurvedic rationale derived from the classical sources cited by the thesis [1–8]; and (3) contemporary external myopia literature used only to contextualize interpretation [9–30]. No unreported patient-level outcome, axial-length change, keratometric change or biochemical mechanism has been invented. This distinction is particularly important because the central clinical question—true control of myopic progression—requires structural and cycloplegic refractive evidence that is not fully available in the thesis dataset.

4. Results

4.1 Participant profile

All 60 participants were reported to have completed the study and were distributed equally between the two treatment groups. Age ranged from 10 to 40 years. The largest category was 15–20 years (22/60; 36.66%), followed by 20–25 years (17/60; 28.33%). Nine participants (15.0%) were 10–15 years, eight (13.33%) were 25–30 years, and two participants each (3.33%) were 30–35 and 35–40 years. Thus, nearly two thirds of the sample were between 15 and 25 years, consistent with recruitment from a population in which school- and young-adult myopia was prominent.

There were 34 females (56.66%) and 26 males (43.33%). The thesis further reports that 78.33% consumed a mixed diet, 76.66% were students, 20% were service employees and 3.33% were homemakers. Most participants (78.33%) were classified as middle socioeconomic status. Ayurvedic Prakriti distribution was reported as Pittakapha 55%, Vatapitta 26.66% and Kaphavata 18.33%. Reading exposure was 4–6 hours/day in 53.33%, 1–3 hours/day in 36.66%, and 7–9 hours/day in 10%. Chronicity was most commonly three or four years. These latter descriptive variables were not used in adjusted efficacy analyses.

The thesis states that none of the 60 participants had a positive family history of myopia. Because this is unexpected relative to contemporary epidemiology [13,14] and because the method

used to define family history was not detailed, this observation should be regarded as a characteristic of the recorded dataset rather than evidence that heredity is unimportant.

Age group (years)	Group I	Group II	Total	%
10–15	4	5	9	15.00
15–20	10	12	22	36.66
20–25	9	8	17	28.33
25–30	5	3	8	13.33
30–35	1	1	2	3.33
35–40	1	1	2	3.33
Total	30	30	60	100.00

Table 1. Age distribution as reported in the thesis (n=60).

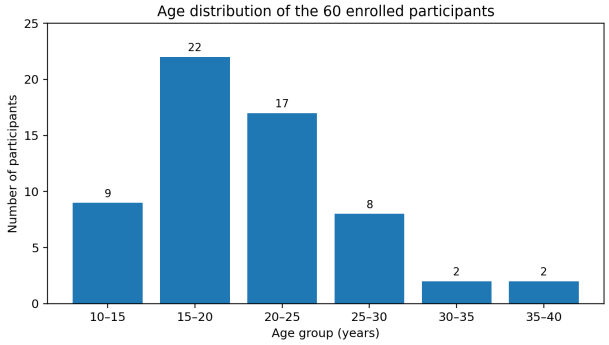

Figure 1. Age distribution of the 60 enrolled participants, generated from the thesis aggregate counts.

4.2 Baseline ocular findings

Across eyes, the most frequently reported baseline visual-acuity category was 6/9–6/18 (41.66%), followed by 6/18–6/36 (35.83%), 6/36 or worse (12.5%) and 6/6–6/9 (10%). The most common refractive range was 1.00–2.00 D of myopic power (43.33% of eyes), followed by 0–1.00 D (30%). The study therefore largely represented low-to-moderate simple myopia rather than high myopia, despite permitting enrollment up to −6.00 D.

4.3 Visual-acuity outcome

In Group I, mean right-eye visual-acuity score increased from 57.33 before treatment to 64.00 after treatment. The thesis reported SD 8.84, SE 3.77, t=4.13 and P<0.01, with a reported improvement percentage of 46.66%. Left-eye mean score increased from 59.67 to 66.00, with SD 8.50, SE 3.76, t=4.08 and P<0.01; the reported improvement percentage was 43.33%.

In Group II, mean right-eye score increased from 56.67 to 65.33, with SD 11.74, SE 4.16, t=4.66 and reported P<0.001; the reported improvement percentage was 50.0%. The left-eye score increased from 55.67 to 65.67, with SD 10.42, SE 4.00, t=4.55 and reported P<0.001; the reported improvement percentage was 46.66%.

The raw mean-score increments were therefore +6.67 and +6.33 points for right and left eyes in Group I, compared with +8.66 and +10.00 points in Group II. These are descriptive differences; no valid between-group significance test can be derived from the published summary table alone because paired covariance and participant-level data are unavailable.

4.4 Clinical refraction

Group I right-eye mean clinical refraction changed from −1.75 D to −1.67 D and left-eye mean from −1.73 D to −1.65 D. The source reported 20% and 22% “improvement,” respectively, with t=2.76 and P<0.01 for both eyes. The absolute shift in the group mean was +0.08 D (toward less minus) in each eye.

Group II right-eye mean refraction changed from −1.79 D to −1.66 D and left-eye mean from −1.80 D to −1.67 D. The source reported improvement percentages of 26.66% and 24%, respectively, with t=3.18 and P<0.001. The absolute shift in the mean was +0.13 D in both eyes. These mean changes are small in dioptric terms and are not equivalent to the much larger “percentage

improvement" numbers printed in the thesis; the percentages therefore appear to describe a responder proportion or another categorical calculation rather than relative change in the mean.

4.5 Overall clinical response and safety

Using the thesis-defined overall response categories, 6/30 participants in Group I (20.0%) and 8/30 in Group II (26.66%) were classified as "myopia decreased/excellent," meaning that visual acuity improved together with a reduction in spectacle power. The remaining 24/30 (80.0%) in Group I and 22/30 (73.33%) in Group II were classified as "myopia stable/good," meaning that vision improved while spectacle power did not reduce. No participant was classified as worsened. Across the total sample, 14/60 (23.33%) therefore met the thesis criterion for reduced spectacle power with improved vision, whereas 46/60 (76.66%) had visual improvement with stable spectacle power.

The thesis reports no adverse reactions in either group and states that refractive error remained stationary in many participants during the three- to six-month post-treatment observation period. The safety statement is reassuring within this small cohort but cannot establish uncommon-event safety because no formal adverse-event coding system, ocular-surface staining scale, intraocular-pressure safety analysis or laboratory monitoring framework was presented.

Group	Eye	BT mean	AT mean	Reported %	SD	SE	t	Reported P
Group I	Right	57.33	64.00	46.66	8.84	3.77	4.13	<0.01
Group I	Left	59.67	66.00	43.33	8.50	3.76	4.08	<0.01
Group II	Right	56.67	65.33	50.00	11.74	4.16	4.66	<0.001
Group II	Left	55.67	65.67	46.66	10.42	4.00	4.55	<0.001

Table 2. Visual-acuity results reproduced from thesis Table 13 and Table 14. BT=before treatment; AT=after treatment. The "reported improvement %" does not equal relative change in the displayed means and is therefore not treated as a calculated effect size.

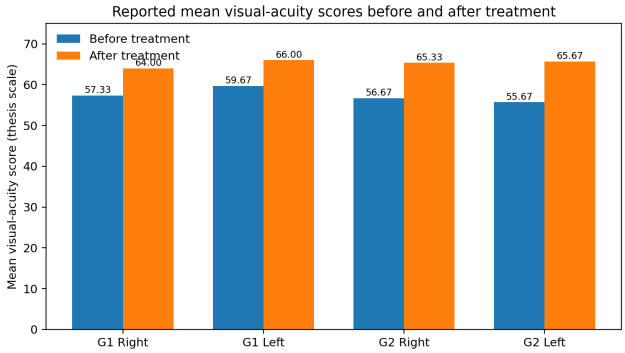

Figure 2. Reported mean visual-acuity scores before and after treatment. Bars are plotted directly from thesis aggregate means; no unreported error bars were reconstructed.

Group	Eye	BT (D)	AT (D)	Reported %	SD	SE	t	Reported P
Group I	Right	−1.75	−1.67	20.00	0.16	4.16*	2.76	<0.01
Group I	Left	−1.73	−1.65	22.00	0.16	4.00*	2.76	<0.01

Group II	Right	−1.79	−1.66	26.66	0.21	0.18	3.18	<0.001*
Group II	Left	−1.80	−1.67	24.00	0.21	0.17	3.18	<0.001*

*Table 3. Clinical-refraction results reproduced from thesis Tables 15–16. *The source contains internally inconsistent statistical fields (including some SE and P-value entries); these have been flagged rather than corrected without raw data.*

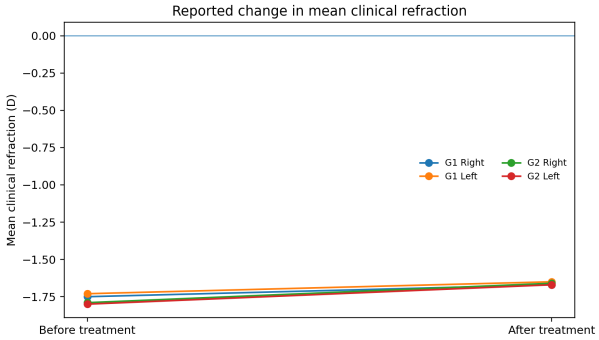

Figure 3. Change in reported mean clinical refraction (diopters). A shift toward zero denotes less minus power. Values are source means, not independently re-estimated effects.

Overall response category	Group I	Group II	Total
Reduced power + improved vision	6 (20.0%)	8 (26.66%)	14 (23.33%)
Stable power + improved vision	24 (80.0%)	22 (73.33%)	46 (76.66%)
Worsened	0	0	0
Total	30	30	60

Table 4. Overall response categories defined by the thesis. "Reduced power + improved vision" corresponds to the thesis label "myopia decreased/excellent"; "stable power + improved vision" corresponds to "myopia stable/good."

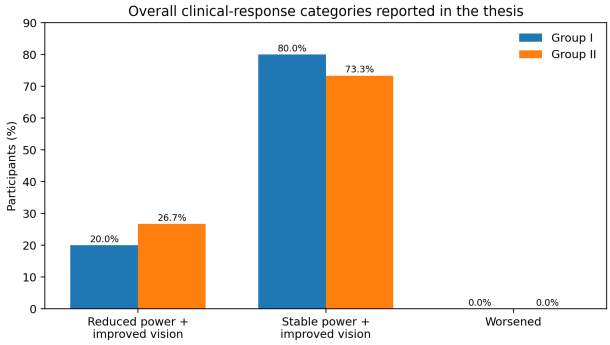

Figure 4. Overall clinical-response categories reported in the thesis, expressed as within-group percentages.

5. Discussion

The thesis-derived data show a consistent direction of change in both active-treatment groups: mean visual-acuity scores increased, reported spectacle power shifted slightly toward less minus, and no participant was placed in the "worsened" overall-response category. Group II, which received oral Madhuvara Ghrita in addition to the same Nasya/Tarpana schedule used in Group I, had larger numerical increases in mean visual-acuity score and a larger mean shift in clinical refraction. These observations explain the original thesis conclusion that the combined local-plus-oral regimen appeared more effective. A modern interpretation, however, must distinguish a signal from proof.

The strongest signal in the dataset is visual performance. Group I gained approximately 6–7 points on the thesis visual-acuity scale, while Group II gained approximately 9–10 points. Such improvement may be clinically meaningful to participants, particularly if it reflects better unaided distance recognition or reduced ocular fatigue. Nevertheless, visual acuity is influenced by refractive correction, accommodation, illumination, chart familiarity, squinting and test–retest variability. In contemporary myopia-

control trials, an intervention is considered disease-modifying primarily when it reduces cycloplegic spherical-equivalent progression and axial elongation relative to a control group [18–28]. The thesis does not provide a comparable control condition or a complete axial-length dataset.

The refractive results require particularly cautious interpretation. Mean changes of 0.08 D in Group I and 0.13 D in Group II are small. Modern clinical trials often report annual progression on the order of tenths of a diopter and fractions of a millimeter of axial length, but the meaningful quantity is the difference from an appropriately randomized control group measured under standardized cycloplegia. A small positive shift in manifest or retinoscopic refraction may arise from accommodation, measurement variability or regression to the mean. The thesis permits participants to continue wearing spectacles, which is appropriate ethically, but spectacle use does not itself provide a no-treatment reference.

The printed "percentage improvement" values in the thesis appear to have a different denominator than the group-mean change. For example, Group I right-eye mean visual-acuity score changes from 57.33 to 64.00, which is not a 46.66% relative increase, and mean refraction changes from −1.75 to −1.67 D, which is not a 20% reduction in absolute dioptric magnitude. The most likely interpretation is that the percentages refer to proportions of participants/eyes that improved according to a categorical rule. Because the exact computation is not specified, this paper reports the values without using them for effect-size calculation. This is preferable to retrofitting an unsupported statistical meaning.

Accordingly, the most defensible conclusion is that Madhuvara Ghrita administered through the studied regimens was associated with improved visual-acuity scores and small favorable shifts in reported refraction during the observation period, with numerically larger changes when oral treatment was added. Whether this represents a true effect on the biological progression of myopia remains unanswered. The thesis provides a rationale and feasibility signal for a modern controlled trial rather than a basis for replacing established optical correction or evidence-based myopia-control strategies.

6. Conclusion

In this thesis-derived open comparative study, 60 participants with Timira/simple myopia received Madhuvara Ghrita as Nasya and Tarpana, with half also receiving continuous oral Madhuvara Ghrita for three months. Both groups showed higher mean visual-acuity scores after treatment, and the reported mean clinical refraction shifted slightly toward less minus power. The local-plus-oral group showed numerically larger changes and a greater proportion of participants meeting the thesis criterion of improved vision with reduced spectacle power (26.66% versus 20.0%). No adverse reactions were reported.

These findings should be interpreted as preliminary. The study lacks a non-active comparator, provides no formal between-group inferential test, does not report a complete axial-length outcome, and contains inconsistencies in some percentages, standard errors and P-value fields. Therefore, the dataset does not establish that Madhuvara Ghrita slows axial myopia progression. The appropriate next step is a prospectively registered, adequately powered randomized controlled trial using standardized cycloplegic refraction, optical biometry, masked outcome assessment, reproducible

pharmaceutical standardization and structured safety monitoring. Such a design would allow the traditional therapeutic rationale to be evaluated with endpoints accepted in contemporary myopia research.

Declarations

Ethics: The source thesis states that ethical-committee clearance was obtained and written informed consent was taken. The manuscript does not add an unverified ethics approval number.

Funding: Not reported in the source thesis; to be confirmed by the authors before submission.

Conflict of interest: To be declared by the authors before submission.

Data availability: This manuscript uses aggregate results reported in the uploaded thesis. Participant-level raw data were not available for independent reanalysis.

Author contributions: To be completed according to the target journal's authorship policy.

Clinical interpretation: The study should not be interpreted as evidence to discontinue clinically indicated spectacle correction or established myopia-control care.

References

1. Shastri AD, editor. Sushruta Samhita of Sushruta. Varanasi: Chaukhamba Sanskrit Sansthan; 2002.
2. Tripathi R, editor. Ashtanga Sangraha. Varanasi: Chaukhamba Sanskrit Sansthan; 1996.
3. Paradakara HS, editor. Ashtanga Hridaya of Vagbhata. Varanasi: Chaukhamba Surbharati Prakashan; 2007.
4. Mishra BS, Vaishya RL, editors. Bhavaprakasha Nighantu. Varanasi: Chaukhamba Sanskrit Sansthan; 2004.
5. Murthy KRS, translator. Sharangadhara Samhita. Varanasi: Chaukhamba Orientalia; 1984.
6. Sharma PV. Dravyaguna Vijnana. Vol 2. Varanasi: Chaukhamba Bharati Academy; 1999.
7. Shukla V, Tripathi R, editors. Charaka Samhita. Vols 1–2. Delhi: Chaukhamba Sanskrit Pratishthan; 2002.
8. Upadhyaya Y, editor. Madhava Nidana. Part 1. Varanasi: Chaukhamba Sanskrit Sansthan; 2000.
9. Holden BA, Fricke TR, Wilson DA, Jong M, Naidoo KS, Sankaridurg P, et al. Global prevalence of myopia and high myopia and temporal trends from 2000 through 2050. Ophthalmology. 2016;123(5):1036–1042. doi:10.1016/j.ophtha.2016.01.006.
10. Saxena R, Vashist P, Tandon R, Pandey RM, Bhardawaj A, Menon V, et al. Prevalence of myopia and its risk factors in urban school children in Delhi: the North India Myopia Study (NIM Study). PLoS One. 2015;10(2):e0117349. doi:10.1371/journal.pone.0117349.
11. Saxena R, Vashist P, Tandon R, Pandey RM, Bhardawaj A, Gupta V, et al. Incidence and progression of myopia and associated factors in urban school children in Delhi: the North India Myopia Study (NIM Study). PLoS One. 2017;12(12):e0189774. doi:10.1371/journal.pone.0189774.
12. Gopalakrishnan A, Hussaindeen JR, Sivaraman V, Swaminathan M, Wong YL, Armitage JA, et al. Prevalence of myopia among urban and suburban school children in Tamil Nadu, South India: findings from the Sankara Nethralaya Tamil Nadu Essilor Myopia (STEM) Study. Ophthalmic Physiol

Opt. 2022;42(2):345–357. doi:10.1111/opo.12943.

13. Kiefer AK, Tung JY, Do CB, Hinds DA, Mountain JL, Francke U, et al. Genome-wide analysis points to roles for extracellular matrix remodeling, the visual cycle, and neuronal development in myopia. PLoS Genet. 2013;9(2):e1003299. doi:10.1371/journal.pgen.1003299.
14. Low W, Dirani M, Gazzard G, Chan YH, Zhou HJ, Selvaraj P, et al. Family history, near work, outdoor activity, and myopia in Singapore Chinese preschool children. Br J Ophthalmol. 2010;94(8):1012–1016.
15. Rose KA, Morgan IG, Ip J, Kifley A, Huynh S, Smith W, et al. Outdoor activity reduces the prevalence of myopia in children. Ophthalmology. 2008;115(8):1279–1285. doi:10.1016/j.ophtha.2007.12.019.
16. He M, Xiang F, Zeng Y, Mai J, Chen Q, Zhang J, et al. Effect of time spent outdoors at school on the development of myopia among children in China: a randomized clinical trial. JAMA. 2015;314(11):1142–1148. doi:10.1001/jama.2015.10803.
17. Wu PC, Chen CT, Lin KK, Sun CC, Kuo CN, Huang HM, et al. Myopia prevention and outdoor light intensity in a school-based cluster randomized trial. Ophthalmology. 2018;125(8):1239–1250.
18. Yam JC, Jiang Y, Tang SM, Law AKP, Chan JJ, Wong E, et al. Low-concentration atropine for myopia progression (LAMP) study: a randomized, double-blinded, placebo-controlled trial of 0.05%, 0.025%, and 0.01% atropine eye drops in myopia control. Ophthalmology. 2019;126(1):113–124. doi:10.1016/j.ophtha.2018.05.029.
19. Yam JC, Li FF, Zhang X, Tang SM, Yip BHK, Kam KW, et al. Two-year clinical trial of the low-concentration atropine for myopia progression (LAMP) study: phase 2 report. Ophthalmology. 2020;127(7):910–919. doi:10.1016/j.ophtha.2019.12.011.
20. Zhang XJ, Zhang Y, Yip BHK, Kam KW, Tang F, Ling X, et al. Five-year clinical trial of the low-concentration atropine for myopia progression (LAMP) study: phase 4 report. Ophthalmology. 2024;131(9):1011–1020.
21. Yam JC, Zhang XJ, Zhang Y, Yip BHK, Tang F, Wong ES, et al. Effect of low-concentration atropine eyedrops vs placebo on myopia incidence in children: the LAMP2 randomized clinical trial. JAMA. 2023;329(6):472–481.
22. Repka MX, Weise KK, Chandler DL, Wu R, Melia BM, Beck RW, et al. Low-dose 0.01% atropine eye drops vs placebo for myopia control: a randomized clinical trial. JAMA Ophthalmol. 2023;141(8):756–765. doi:10.1001/jamaophthalmol.2023.2855.
23. Lam CSY, Tang WC, Tse DYY, Lee RPK, Chun RKM, Hasegawa K, et al. Defocus Incorporated Multiple Segments (DIMS) spectacle lenses slow myopia progression: a 2-year randomised clinical trial. Br J Ophthalmol. 2020;104(3):363–368. doi:10.1136/bjophthalmol-2018-313739.
24. Bao J, Huang Y, Li X, Yang A, Zhou F, Wu J, et al. Spectacle lenses with aspherical lenslets for myopia control vs single-vision spectacle lenses: a randomized clinical trial. JAMA Ophthalmol. 2022;140(5):472–478. doi:10.1001/jamaophthalmol.2022.0401.
25. Chamberlain P, Peixoto-de-Matos SC, Logan NS, Ngo C, Jones D, Young G. A 3-year randomized clinical trial of MiSight lenses for myopia control. Optom Vis Sci. 2019;96(8):556–567. doi:10.1097/OPX.0000000000001410.

26. Cho P, Cheung SW. Retardation of myopia in Orthokeratology (ROMIO) study: a 2-year randomized clinical trial. Invest Ophthalmol Vis Sci. 2012;53(11):7077–7085.
27. Jakobsen TM, Møller F. Control of myopia using orthokeratology lenses in Scandinavian children aged 6 to 12 years: eighteen-month data from the Danish Randomized Study—CONTROL study. Acta Ophthalmol. 2022;100(2):175–182. doi:10.1111/aos.14911.
28. Kinoshita N, Konno Y, Hamada N, Kanda Y, Shimmura-Tomita M, Kakehashi A. Additive effects of orthokeratology and atropine 0.01% ophthalmic solution in slowing axial elongation in children with myopia: first year results. Jpn J Ophthalmol. 2018;62(5):544–553. doi:10.1007/s10384-018-0608-3.
29. Gwiazda J, Hyman L, Hussein M, Everett D, Norton TT, Kurtz D, et al. A randomized clinical trial of progressive addition lenses versus single vision lenses on the progression of myopia in children. Invest Ophthalmol Vis Sci. 2003;44(4):1492–1500. doi:10.1167/iovs.02-0816.
30. Suryavanshi SV, Barve K, Utpat SV, Kulkarni YA. Triphala churna ameliorates retinopathy in diabetic rats. Biomed Pharmacother. 2022;148:112711. doi:10.1016/j.biopha.2022.112711.