ORIGINAL ARTICLE

Myopia prevention practices among ophthalmologists in Hong Kong: a cross-sectional survey

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Abstract

Objectives: To explore the preferred pharmacological, optical, and behavioral interventions for myopia control among private-sector ophthalmologists in Hong Kong.
Methods: Between July and August 2025, a survey was distributed electronically to private-sector ophthalmologists in Hong Kong. Ophthalmologists working exclusively in the public sector were excluded because interventions to control myopia, such as low-dose atropine, optical interventions, and red-light therapy, are only available in the private sector. Data collected included participants' demographics, years of clinical experience, and interventions used including pharmacological, optical, behavioral, and red-light therapies. All responses were aggregated for analysis.
Results: In total, 118 private-sector ophthalmologists were included in analysis. In terms of preferred treatment modality, 91.5% preferred pharmacological, 5.1% preferred optical, and 3.4% preferred behavioral interventions although many used a combination of modalities. Most (97.5%) respondents had prescribed eye drops, typically atropine, and the most common concentrations were 0.05% and 0.01%. However, there was no consensus on the criteria for initiation and discontinuation of eye drop treatment. The most frequently prescribed optical intervention was peripheral defocus spectacle lenses (86.5%). Behavioral recommendations were also commonly provided. Only 5.1% of respondents prescribed red-light therapy.
Conclusion: Among private-sector ophthalmologists in Hong Kong, low-dose atropine is the most frequently used pharmacological intervention for myopia. However, there is no consensus on the criteria for initiating and discontinuing treatment. Optical intervention (particularly peripheral defocus spectacle lenses) and behavioral recommendations are also commonly used.

Key words: Atropine; Health surveys; Myopia; Ophthalmologists

Introduction

Myopia is a major public health concern across Asia, with prevalence rising sharply over the past two decades.[1] The Chinese government has prioritized childhood myopia prevention, implementing policies aimed at early detection and intervention.[2] Without timely and effective control, children with myopia are at risk of progressing to high or pathological myopia, which significantly increases the risk of developing vision-threatening complications (such as myopic maculopathy, choroidal neovascularization, and retinal detachment),[3] impairs quality of life, and increases the healthcare burden.[4]

Myopia is potentially preventable,[5,6] and its progression can be slowed by behavioral, optical, and pharmacological interventions.[7-9] Behavioral interventions include spending more time outdoors in natural light and avoiding excessive near work. Optical interventions include wearing glasses with defocus incorporated multiple segments (DIMS)

or highly aspherical lenslet target (HALT) lenses, orthokeratology, and other specialized contact lenses. Pharmacological interventions, particularly low-dose atropine eye drops, have gained attention for their efficacy and safety profile.[10]

The LAMP (Low-Concentration Atropine for Myopia Progression) studies in Hong Kong support treatment with low-dose atropine to slow the progression of myopia.[11,12] There is a concentration-dependent effect; atropine 0.05% (compared with lower concentrations) shows the most significant reduction in myopic progression with minimal adverse effects. We conducted a cross-sectional survey to explore the preferred pharmacological, optical, and behavioral interventions for myopia control among private-sector ophthalmologists in Hong Kong.

Methods

Between July and August 2025, a survey was distributed electronically through ophthalmology communication networks to private-sector ophthalmologists. Ophthalmologists working exclusively in the public sector were excluded because interventions to control myopia, such as low-dose atropine, optical interventions, and red-light therapy, are only available in the private sector.

Data collected included participants' demographics, years of clinical experience, and interventions used including pharmacological, optical, behavioral, and red-light therapies. All responses were aggregated for analysis.

Results

In total, 118 private-sector ophthalmologists in Hong Kong were included in the analysis. In terms of clinical experience, 36.4% had practiced for 25 years, 22.0% for 20 to 25 years, 20.3% for 15 to 20 years, and 21.2% for 10 to 15 years. In terms of experience in myopia control, 29.7% had >10 years, 28.0% had 6 to 10 years, 29.7% had 3 to 5 years, and 12.7% had 1 to 2 years. In terms of preferred treatment modality, 91.5% preferred pharmacological, 5.1% preferred optical, and 3.4% preferred behavioral interventions although many used a combination of modalities. Most (97.5%) respondents had prescribed eye drops, typically atropine, and the most common concentrations (multiple options can be selected) were 0.05% (93.9%) and 0.01% (79.1%), followed by 0.025% (35.7%), 0.125% (20.0%), and 1% (10.4%). No respondents reported using cyclopentolate, pirenzepine, or tropicamide.

Regarding criteria for initiation of eye drops (multiple options could be selected), 41.7% of respondents started prescribing eye drops to those with any myopia aged >4 years, 37.4% waited for the progression to exceed 1.00 D per year, 33.9% started prescribing as soon as myopia was identified regardless of age, 18.3% initiated treatment when myopia exceeded -1.00 D, and 13.9% used other criteria.

Regarding the age of treatment discontinuation, 31% of respondents discontinued atropine therapy after patients aged 17 years, 20.4% after 16 years, 17.7% after 14 years, 10.6% after 15 years, 3.5% after 13 years, and 0.9% after 12 years. Notably, 16.1% did not discontinue treatment in any patient. After treatment discontinuation, 28.6% of respondents reported rebound cases, 49.1% did not, and 22.3% had not discontinued treatment.

The most frequently prescribed optical intervention (multiple options could be selected) was peripheral defocus spectacles (including DIMS/HALT, 86.5%), followed by contact lenses with peripheral defocus (35.6%), orthokeratology (33.1%), full correction spectacles (27.1%), progressive addition lenses (11.0%), bifocal spectacle lenses (6.8%), and optical undercorrection (5.9%). Less commonly used options included bifocal soft contact lenses (1.7%), single vision gas permeable lenses (1.7%), monofocal soft contact lenses (0.8%), and single vision soft contact lenses (0.8%).

The most common behavioral recommendations (multiple options can be selected) were decreasing smartphone use (85.6%), reducing screen time (82.2%), maintaining a reading distance of ≥34 cm (75.4%), encouraging outdoor activities (64.4%), and reading in natural light (55.1%). Less common recommendations included visual therapy (1.7%) and biofeedback (1.7%). Red-light therapy was rarely used; only 5.1% of respondents prescribed it.

Discussion

Among private-sector ophthalmologists in Hong Kong, 99.2% engaged in myopia management, reflecting awareness and responsiveness to the growing prevalence of myopia. Myopia control has become a widely practiced component of ophthalmic care. Atropine eye drops were the preferred pharmacological intervention, particularly concentrations of 0.05% and 0.01%, consistent with findings from the Low-concentration Atropine for the Treatment of Myopia 2 study[10] and the LAMP studies,[11,12] which demonstrated that atropine 0.05% eye drops most effectively slow the progression of myopia with minimal adverse effects on pupil size, accommodation, and near visual function.

Most respondents adopted early intervention with eye drops for patients starting at age 4 years, but there is no consensus. Early-onset myopia is associated with faster progression and a higher risk of pathological outcomes.[13] The age of treatment discontinuation also varied, ranging from 12 to >17 years; 28.6% of respondents reported rebound effects, underscoring the importance of tapering strategies and long-term follow-up.[14] Further research is required to establish evidence-based guidance on optimal tapering protocols.

Peripheral defocus spectacle lenses (DIMS/HALT) are effective optical interventions,[15,16] and 86.5% of respondents prescribed them. Orthokeratology and contact lenses with peripheral defocus were also commonly prescribed by approximately one-third of respondents.

Behavioral recommendations (reducing screen time, increasing outdoor activities, and maintaining proper reading habits) are supported by epidemiological studies.[9,17] Visual therapy and biofeedback show limited evidence.[18] Red-light therapy was rarely used, likely owing to concerns about safety, accessibility, or insufficient clinical validation.[19]

One limitation of our study was inclusion of private-sector ophthalmologists only, whose practices may not reflect those in public institutions. Our findings may not be generalizable to ophthalmologists working solely in the public sector. Additionally, voluntary participation potentially introduces self-selection bias, as those with stronger views or greater involvement in myopia control may be more likely to respond. Results of the survey may be subject to self-reporting bias, recall bias, and social desirability bias.

Conclusion

Among Hong Kong private-sector ophthalmologists, low-dose atropine is the most frequently used pharmacological intervention for myopia. However, there is no consensus on the criteria for initiating and discontinuing treatment. Optical intervention (particularly peripheral defocus spectacle lenses) and behavioral recommendations are also commonly used. Our findings underscore the need for a consensus in myopia management, including initiation criteria, treatment duration, and discontinuation protocols, particularly in light of concerns about rebound effects. Red light therapy is an emerging option; ongoing research is essential to ensure its safe and effective use.

Contributors

All authors designed the study, acquired the data, analyzed the data, drafted the manuscript, and critically revised the manuscript for important intellectual content. All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

As an advisor of the journal, TCK was not involved in the peer review process. Other authors have disclosed no conflicts of interest.

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Data availability

All data analyzed in this study are available from the corresponding author upon reasonable request.

Ethics approval

The study was conducted in accordance with the tenets of the Declaration of Helsinki. The participants provided written informed consent for publication.

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References

1. *Liang J, Pu Y, Chen J, et al. Global prevalence, trend and projection of myopia in children and adolescents from 1990 to 2050: a comprehensive systematic review and meta-analysis. Br J Ophthalmol 2025; 109:362-71.* Crossref
2. *Jan C, Li L, Keay L, Stafford RS, Congdon N, Morgan I. Prevention of myopia, China. Bull World Health Organ 2020; 98:435-7.* Crossref
3. *Haarman AEG, Enthoven CA, Tideman JWL, Tedja MS, Verhoeven VJM, Klaver CCW. The complications of myopia: a review and meta-analysis. Invest Ophthalmol Vis Sci 2020; 61:49.* Crossref
4. *Sankaridurg P, Tahhan N, Kandel H, et al. Impact of myopia. Invest Ophthalmol Vis Sci 2021; 62:2.* Crossref
5. *Chen Y, Mueller A, Morgan I, et al. Best practice in myopia control: insights and innovations for myopia prevention and control: a round table discussion. Br J Ophthalmol 2024; 108:913-4.* Crossref
6. *Wang B, Watt K, Chen Z, Kang P. Predicting the child who will become myopic – can we prevent onset? Clin Exp Optom 2023; 106:815-24.* Crossref
7. *Saw SM, Matsumura S, Hoang QV. Prevention and management of myopia and myopic pathology. Invest Ophthalmol Vis Sci 2019; 60:488-99.* Crossref
8. *Zhang XJ, Zaabaar E, French AN, et al. Advances in myopia control strategies for children. Br J Ophthalmol 2025; 109:165-76.* Crossref
9. *Biswas S, El Kareh A, Qureshi M, et al. The influence of the environment and lifestyle on myopia. J Physiol Anthropol 2024; 43:7.* Crossref
10. *Chia A, Chua WH, Cheung YB, et al. Atropine for the treatment of childhood myopia: safety and efficacy of 0.5%, 0.1%, and 0.01% doses (Atropine for the Treatment of Myopia 2). Ophthalmology 2012; 119:347-54.* Crossref
11. *Yam JC, Jiang Y, Tang SM, 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; 126:113-24.* Crossref
12. *Yam JC, Zhang XJ, Zhang Y, et al. Effect of low-concentration atropine eyedrops vs placebo on myopia incidence in children: the LAMP2 randomized clinical trial. JAMA 2023; 329:427-81.* Crossref
13. *Myopia: Causes, Prevention, and Treatment of an Increasingly Common Disease. DC: National Academies Press; 2024.*
14. *Lee SH, Tsai PC, Chiu YC, Wang JH, Chiu CJ. Myopia progression after cessation of atropine in children: a systematic review and meta-analysis. Front Pharmacol 2024; 15:1343698.* Crossref
15. *Bao J, Huang Y, Li X, et al. Spectacle lenses with aspherical lenslets for myopia control vs single-vision spectacle lenses: a randomized clinical trial. JAMA Ophthalmol 2022; 140:472-8.* Crossref
16. *Lam CSY, Tang WC, Tse DY, et al. Defocus incorporated multiple segments (DIMS) spectacle lenses slow myopia progression: a 2-year randomised clinical trial. Br J Ophthalmol 2020; 104:363-8.* Crossref
17. *Ha A, Lee YJ, Lee M, Shim SR, Kim YK. Digital screen time and myopia: a systematic review and dose-response meta-analysis. JAMA Netw Open 2025; 8:e2460026.* Crossref
18. *American Academy of Ophthalmology. Complementary Therapy Assessment: Visual Training for Refractive Errors. Accessed 29 August 2025. Available from: https://www.aao.org*
19. *Chang DJ, Sriram PL, Jeong J, Saw SM, Sevdalis N, Najjar RP. Light therapy for myopia prevention and control: a systematic review on effectiveness, safety, and implementation. Transl Vis Sci Technol 2024; 13:31.* Crossref