



High Myopia in Madrasa versus School-Going Children: A Comparative Case Report from Taunsa, Pakistan

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Case Report

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Abstract

High myopia is increasingly diagnosed among South Asian children and is closely tied to sustained near work, limited outdoor exposure, and poor lighting during study, though the near-work pattern of Qur'anic memorisation, known as Hifz, in madrasa settings has received little research attention. This report describes two age-matched male patients, aged 12 and 12.5 years, examined at a private eye clinic in Taunsa District, Punjab in early 2024 with progressive blurring of distance vision. Case 1, a full-time madrasa Hifz student, spent long hours reciting the Qur'an at close range under dim lighting with almost no outdoor exposure. Case 2 attended a conventional day school, with less overall near work but notable recreational screen use. Cycloplegic refraction confirmed high myopia in both patients, with Case 1 showing greater axial elongation, faster reported progression, and early myopic fundus changes. Both cases share the same modifiable risk profile of heavy near work and insufficient outdoor time, with the madrasa environment appearing to intensify this risk through shorter reading distance and dimmer lighting, although genetic loading may account for much of the observed difference. This comparison highlights an under-studied high-risk environment for paediatric myopia progression and supports extending myopia-awareness efforts to religious-education settings.

Keywords: High Myopia; Madrasa Student; Near Work; Axial Length; Outdoor Exposure; School Student

Introduction

Myopia has become one of the more pressing paediatric public health issues of the past decade, and East and South Asian children carry a disproportionate share of the burden [1-7]. High myopia in childhood matters beyond the need for thicker spectacle lenses: it carries a real risk of posterior staphyloma, myopic maculopathy, and a higher lifetime chance of retinal detachment and glaucoma, some of which can begin to show even before adulthood [1].

A large body of research now ties myopia onset and progression to sustained near-work activity, less time spent outdoors, and near work carried out at short working distances or under poor lighting [1,2,3]. In Pakistan, a considerable number of school-aged children also attend madrasas for Qur'anic education, either as their sole schooling or alongside a conventional school day. Hifz students in particular can spend many hours daily in close, static near work with the Mus'haf, often in modestly lit

rooms and with little scheduled time outdoors. A search of the recent literature did not identify a dedicated study of madrasa-based near work and myopia published in the last five years; the closest available evidence remains general regional prevalence data [6,8,9]. That gap is itself part of the motivation for this comparison, rather than something this report claims to fill.

This report sets out two cases, one boy enrolled full-time in a madrasa Hifz programme and one boy attending a conventional government school, both presenting with high myopia. The aim is to lay their near-work exposures side by side and consider what bearing this might have on their refractive and axial findings, while being explicit that a two-case comparison can only generate hypotheses, not confirm them.

Case Presentation

Case 1: Madrasa (Hifz) Student, Aged 12 Years

A 12-year-old boy, a full-time resident student in a local madrasa's Hifz programme for the past three years, presented in early 2024 with a two-year history of gradually blurring distance vision. He first noticed the problem when he could no longer make out the imam's gestures across the prayer hall. He also reported frequent eye-rubbing and squinting during recitation, along with occasional frontal headache by the end of the day.

His daily routine involved roughly 8 to 10 hours of near work spread across pre-dawn, midday, and post-Maghrib recitation sessions, typically done seated cross-legged on the floor with the Mus'haf held close to the body, sometimes less than 20 cm from his eyes, particularly during the dim evening session. Scheduled outdoor time came to under 30 minutes a day. There was no history of spectacle wear, ocular trauma, or systemic illness. His father had moderate myopia; his mother did not.

Examination: Unaided visual acuity was 6/36 in both eyes, improving to 6/9 with correction. The anterior segment was unremarkable bilaterally. Cycloplegic autorefraction (1% cyclopentolate) confirmed high myopia, and optical biometry showed elevated axial length in both eyes. Dilated fundus examination revealed a tessellated fundus, mild peripapillary atrophy, and a tilted disc in the right eye, with no staphyloma or maculopathy. Intraocular pressures were normal in both eyes.

The working diagnosis was high myopia with early myopic fundus changes, likely compounded by intensive

near-work exposure at a short working distance, though a genetic contribution from the paternal myopia cannot be excluded. He was prescribed full spectacle correction, and his guardians were counselled on lighting and posture during recitation. He was also referred for outdoor-time and near-work-break recommendations, with retinal photography and biometry scheduled every six months.

Case 2: Conventional School Student, Aged 12.5 Years

A 12.5-year-old boy in Grade 7 at a local government school presented in early 2024 with a one-year history of trouble reading the classroom whiteboard, which had already led him to move to the front row. He also mentioned occasional headache after long homework or gaming sessions.

His daily near-work load worked out to about 5 to 6 hours (school lessons and homework combined), mostly done at a desk at a reading distance of 25 to 30 cm under adequate room lighting. He also spent around two hours a day on a smartphone for both educational and recreational use. Outdoor time, mainly through the school's sports period and evening play with friends, averaged 1 to 1.5 hours a day. Both of his parents were myopic. There was no history of spectacle wear, trauma, or systemic disease.

Examination: Unaided visual acuity was 6/24 in the right eye and 6/18 in the left, improving to 6/6 with correction. Anterior segment findings were unremarkable. Cycloplegic refraction confirmed high myopia in both eyes, with axial length elevated but to a lesser degree than in Case 1. Fundus examination showed a tessellated fundus with a normal disc and macula bilaterally. Intraocular pressures were normal.

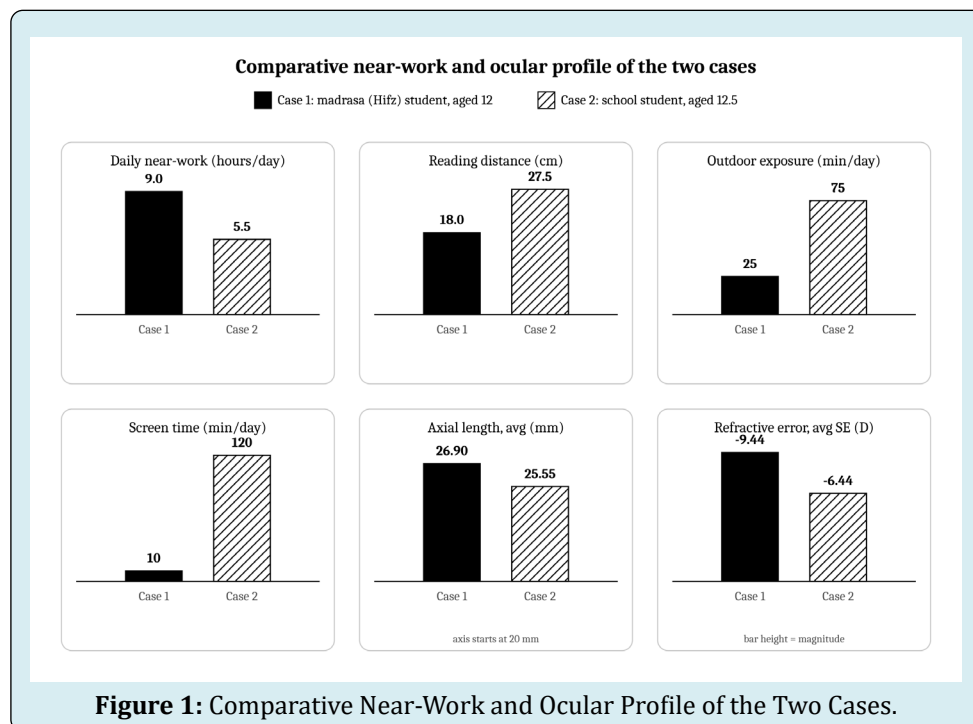
He was diagnosed with high myopia at an early stage. Given that both parents are myopic, a genetic contribution is at least as plausible an explanation for his findings as his near-work or screen-time pattern, and the two cannot be disentangled from history alone. Management included full spectacle correction, counselling on screen-time and near-work breaks (the 20-20-20 rule), encouragement to spend more time outdoors, and biometric follow-up every six months.

Comparative Summary

Table 1 sets out the near-work exposure, refractive, biometric, and fundus findings for both cases side by side.

Parameter	Case 1: Madrasa Student (Aged 12)	Case 2: School Student (Aged 12.5)
Presenting complaint	Gradual blurring of distance vision over 18 months; frequent squeezing of eyes while reading the Qur'an	Difficulty reading the whiteboard for 12 months; headache after prolonged study
Daily near-work load	Approx. 8 to 10 hours/day (Hifz recitation and Qur'anic text study, mostly seated cross-legged with book held close)	Approx. 5 to 6 hours/day (school lessons, homework, and an average of 2 hours/day on a smartphone/tablet)
Typical reading distance	Under 20 cm (book often held close to chest/lap while rocking)	25 to 30 cm (desk-based reading)
Ambient lighting during near work	Dim, often single-bulb or natural light through small windows; evening sessions after Maghrib under low-wattage lighting	Adequate room lighting; desk lamp used for homework
Outdoor/daylight exposure	Under 30 minutes/day (limited recess between recitation sessions)	Approx. 1 to 1.5 hours/day (school sports period and outdoor play)
Screen time	Minimal (under 15 minutes/day)	Approx. 2 hours/day (educational apps, entertainment)
Family history of myopia	Father: moderate myopia; mother: emmetropic	Both parents myopic (father -4.00 D, mother -3.50 D)
Uncorrected visual acuity (Right/Left)	6/36, 6/36	6/24, 6/18
Cycloplegic refraction (Right)	-8.75 DS / -1.00 DC x 175 degrees	-6.25 DS / -0.75 DC x 10 degrees
Cycloplegic refraction (Left)	-9.25 DS / -0.75 DC x 5 degrees	-6.00 DS / -0.50 DC x 170 degrees
Axial length (Right/Left)	26.8 mm / 27.0 mm	25.6 mm / 25.5 mm
Progression (prior 6 months, by history)	-0.75 D	-0.50 D
Fundus findings	Tessellated fundus, mild peripapillary atrophy, tilted disc (Right eye)	Tessellated fundus; disc and macula within normal limits
Working diagnosis	High myopia with early myopic fundus changes, near-work associated	High myopia, early stage, mixed near-work and screen-associated

Table 1: Comparative Near-Work Exposure and Clinical Findings for the Two Cases. DS: Dioptres Sphere; DC: Dioptres Cylinder; D: Dioptres.



Discussion

Both cases meet the criteria for high myopia at a comparable age, against a background of strong environmental exposure and, in Case 2, a clear genetic loading. What the comparison brings out is how differently near work can be structured, and how that structuring might shape the severity of what looks, on the surface, like the same diagnosis. With one case representing each exposure pattern, however, this can only be read as hypothesis-generating; it cannot establish that near-work pattern, rather than genetics or chance, drove the difference between them.

Case 1's madrasa-based Hifz routine stacks several recognised risk factors on top of each other: a longer daily stretch of near work, a markedly shorter habitual reading distance, dim ambient lighting during the evening session, and very little time outdoors. This lines up with the mechanistic literature linking short working distance and low illumination to greater accommodative and peripheral hyperopic defocus, both of which are thought to drive axial elongation, and with the well-documented protective effect of outdoor light exposure against myopia progression [1,2,3]. The faster reported six-month progression and the early peripapillary and disc changes are consistent with a more axially driven, near-work-associated myopia, but a paternal history of myopia was also present, so an unmeasured genetic contribution cannot be ruled out.

Case 2's exposure pattern looks closer to what regional surveys describe as the 'modern school-going child': a shorter but still substantial stretch of near work, topped up by recreational screen use, moderate time outdoors, and a strong parental myopia history [4,5,8]. His lower axial length and slower progression, despite an equally high refractive error, may partly reflect his longer working distance and better lighting. Equally, given that both parents are myopic, genetic loading alone could plausibly account for most of his findings regardless of his near-work pattern. Comparing one case against the other cannot separate these two explanations; both are presented here as competing, not settled, accounts.

Taken together, these two cases suggest that where a child is educated, not just how many hours go into near tasks, may be worth studying as a factor in myopia development. Religious-education settings such as madrasas, where near work is prolonged, done at short distance, and scheduled around low-light periods before dawn and after Maghrib, may be an under-studied environment for paediatric myopia progression. No dedicated recent study of this specific setting was identified in the literature search for this report [6,9], which is itself a gap worth flagging rather than a finding this comparison can close. Given how many children in Pakistan

attend madrasa education, a properly designed cohort or cross-sectional study, not a two-case comparison, would be needed before any firm conclusions about madrasa-specific risk could be drawn.

This comparison has real limits, beyond the genetic confounding already discussed. It rests on two cases rather than a cohort, it relies on caregiver-reported near-work and lighting history, there is no longitudinal biometric data from before presentation, and no biometry device, cycloplegic protocol, or corneal curvature data is specified. Optical coherence tomography was not performed in either case, which limits confidence in ruling out early maculopathy given the concern raised in the Introduction.

Conclusion

This comparison illustrates that children from both madrasa and conventional school backgrounds can develop high myopia by early adolescence, and that the specific pattern of near work, its duration, distance, and lighting, may be worth investigating alongside genetic risk as a factor in how severe it becomes and how fast it progresses. Madrasa-based Hifz education, with its mix of prolonged near work, short reading distance, dim lighting, and limited outdoor time, deserves dedicated study, and in the meantime warrants practical attention in school and madrasa eye-health screening programmes in Pakistan.

Ethical Considerations

Setting: Both patients were seen at a private eye clinic in Taunsa District, Punjab. Clinical data were collected in early 2024.

Patient Consent

Written informed consent was obtained from the parents/guardians of both patients for publication of this case report and accompanying clinical data. Identifying details have been omitted or altered to protect patient confidentiality.

Conflicts of Interest

The authors declare no conflict of interest.

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