

Ocular Morbidity among Female Madrassa Students

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ABSTRACT

Aim: To determine the frequency of ocular morbidity among female students of madrassas.

Study Design: Descriptive cross-sectional study.

Duration and Settings of the Study: This study was conducted from April 2023 to January 2024. It was carried out in the two main female specified madrassas in Peshawar, Pakistan.

Methods: A total of 714 students of the madrassa were screened for ocular morbidity. Participants were selected using a random sampling technique. After obtaining informed consent, each student underwent assessment of visual acuity, refraction, convergence testing and anterior segment examination. Findings were recorded on a proforma, and data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) version 25, with results presented as frequencies and percentages in tables.

Results: Out of 714 madrassa students, 170 had ocular problems. The frequency of ocular morbidity was 23.8%. Refractive error was the major cause of ocular morbidity (14%), followed by convergence insufficiency (4.62%), blepharitis (1.40%), allergic conjunctivitis (0.84%), bacterial conjunctivitis (0.70%), amblyopia (0.70%), and squint (0.56%) respectively. Myopia was the major refractive error (10.08%).

Conclusion: The most common cause of ocular morbidity in madrassa students was refractive error followed by convergence insufficiency. Most of the causes were either treatable or preventable.

Keywords: Madrassa; Ocular Morbidity; Refractive Error; Screening

This article may be cited as: Rehman R, Noreen S, Tariq Y, Jehan A. Ocular Morbidity among Female Madrassa Students. J Clin Comm Ophthalmol 2026; 04(02):43-47.

INTRODUCTION

Childhood ocular morbidity refers to disorders that cause visual impairment (VI) that can significantly affect development, education, employment, and quality of life.^{1,2} With more than a million cases of blindness worldwide, VI in children continues to be a serious global health concern.³ Across Asia, ocular morbidity in children is widely reported, with prevalence ranging from 32% to 43%. Studies from India, Nepal, Bhutan, and Kazakhstan consistently identify

refractive errors as the primary cause.^{3,4,5,6} In Pakistan, the prevalence of ocular morbidity is approximately 30%, with myopia being the most common refractive error, followed by amblyopia, strabismus, and cataract.^{7,8}

In Pakistan, two parallel educational systems exist; the traditional religion-based system and the modern formal system.⁹ The religious system, commonly referred to as madrassas, is often attached to mosques and emphasizes religious instruction, including Quranic recitation (Nazira), memorization (Hifiz), and proper pronunciation (Tajweed). Unlike formal schools, where students are taught in separate classrooms, using blackboards and proper illumination, madrassas students typically study together in a single, overcrowded room, without blackboard facilities, placing their books on small wooden, plastic or iron tables positioned very close to the eyes in improper illumination for a prolonged period of time. Prolonged near work in such settings may increase the risk of developing and progressing myopia.^{10,11} Studies report a high prevalence of refractive errors among madrassas students, ranging from 42% to 65% in Lahore (Punjab) and 52.6% in Haripur

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Date of Submission: 18-09-2025

Date of Review: 13-12-2025

Date of Acceptance: 23-12-2025

DOI: <https://doi.org/10.71177/jcco.v4i02.93>

Journal of Clinical and Community Ophthalmology 2026; Vol 04, Issue 02:43-47

(Khyber Pakhtunkhwa).^{12,7} In Karachi, 51% of madrassas students were found to have refractive errors compared to only 17% in formal school. Approximately three million students are currently enrolled in nearly 35,000 madrassas across Pakistan.⁹

Despite such large number of students enrolled in madrassas, across Pakistan, evidence on their ocular health is limited. Existing research on ocular morbidity in this population is scarce, despite the high burden of refractive errors reported in different regions. This study was undertaken to determine the frequency of refractive errors and other common eye diseases among students of female madrassas in Peshawar. These students represent an underserved population with limited access to eye care, high near-work load, and very limited existing data on ocular health in this group.

METHODS

This cross-sectional study was conducted in two major female-designated registered madrassas in Patang Choke, district Peshawar, Khyber Pakhtunkhwa, Pakistan, from March 2023 to January 2024. Ethical approval was obtained from the institutional research and ethics committee (Ref: 008/PGS/PICO/2023). Permission for the study was obtained from Aalima; female religious head/teacher of these madrassas. Informed written consent was obtained from the students, their parents or guardians, with the assurance that each student had the full right to participate, refuse or withdraw at any time during the study. The study followed the tenets of the Declaration of Helsinki.

A total of 750 female students are studying in these madrassas. We used a random sampling technique for this study. All students aged five to 20 years were included. Students who were unwilling and their parents or guardians did not sign the consent form were excluded from this study. Among 750 students, 714 students agreed to ocular screening voluntarily.

The ocular screening of students was carried by eight members, which included five female optometrists and four female helpers. Data was collected on a pre-designed and pretested proforma.

All the students were examined in one six meter long classroom one by one. Each of them underwent screening in the following sequence:

- A detailed ocular history of each student was taken.
- Distance visual acuity (VA) was tested both monocularly and binocularly using a Snellen VA chart at a distance of six meters. Those who could not read alphabets, a tumbling E notation of the Snellen VA chart was used.
- Students with VA worse than 6/9 were tested with a pinhole to differentiate refractive error from other pathologies. Objective refraction was performed with a retinoscope, followed by subjective refinement for

best corrected VA.

- Convergence insufficiency (CI) was measured using a Royal Air Force (RAF) ruler.
- Ocular deviation was screened using the Hirschberg test with a torchlight, extraocular motility assessment with a target held at 40cm, and the cover-uncover test for squint.
- Binocular Loup was used for general eye examination of the anterior segment, such as eyelids, conjunctiva and cornea etc.
- Direct ophthalmoscopy was performed to examine any opacity of the ocular media and fundus examination.
- Students with anterior segment pathologies such as conjunctivitis, blepharitis, chalazion, sty, corneal opacity, or other pathologies were referred to the hospital for further evaluation and management. Parents were informed about the referral through the madrassa administration.

Data were entered and analyzed using SPSS software. Results were presented in the form of frequencies and percentages in tables.

RESULTS

A total of 714 female students, with a mean age of 14.88 ± 5.31 years, participated in this study. Most of the madrassa students were in the age group between 11-15 years (41.73%; n=298). Among different levels of religious education, most of the students were in Ilam (50.42%; n= 360), followed by Nazira (20.58%; n=147). Details are shown in Table 1.

Out of 714 female madrassa students, 100 (14%) had refractive error. The most common refractive error among them was myopia (10.8%; n=72). Details are shown in table 2.

Among the participants 170 (23.8%) had ocular morbidity and 544 (76.2%) were normal. The most common cause of ocular morbidity was refractive error (14%; n=100) followed by convergence insufficiency (4.62%; n=33). Details about the ocular morbidity are shown in Table 3.

DISCUSSION

In our study, a total of 714 female madrassa students were examined. The frequency of ocular morbidity was 23.8%. The most leading cause of ocular morbidity was refractive error followed by CI. A study conducted in Lasbella Baluchistan on Madrassa student reported almost similar (22.8%) prevalence of ocular morbidity.¹⁴ These results were also comparable with a study conducted in a high school in Bannu, a district in KP which reported 21.2% of prevalence in such children.¹³ International studies have also reported similar prevalence of ocular morbidity, ranging from 18% to 34% in school going children.^{15,16}

Table 1: Demographic profile of the female madrasa students (n=714)

Demographic Profile	Frequency (n)	Percentages
Age range	05-10	185
	11-15	298
	16-20	231
Class level of education	Qaida	68
	Nazira	147
	Hifz	119
	Ilam	360
	Tajweed	20

Table 2: Distribution of refractive errors among female madrasa students (n = 714)

Types of refractive error	Frequency (n)	Percentages
Emmetrope	614	85.99
Myopia	72	10.08
Hyperopia	22	3.08
Astigmatism	06	0.84
Total	714	100

Table 3: Ocular morbidity among female madrasa students (n=714)

Ocular disease	Frequency (n)	Percentages
Refractive error	100	14.0
Convergence insufficiency	33	4.62
Blepharitis	10	1.40
Allergic conjunctivitis	6	0.84
Bacterial conjunctivitis	5	0.70
Squint	4	0.56
Amblyopia	5	0.70
Chalazion	2	0.28
Stye	2	0.28
Ptosis	1	0.14
Corneal opacity	1	0.14
Nystagmus	1	0.14
Total number of female students with ocular morbidity	170	23.8

In the present study, refractive error was the most common cause of ocular morbidity with a prevalence of 14%. These findings are comparable with studies conducted on school going children in Lakki Marwat and Karachi respectively.^{9,17} But a study, conducted on visual health and refractive error in school going children in Hayatabad

Medical Complex Peshawar, reported a highest frequency of 32.9% refractive error in this age population.¹⁸ This might be due to study setting and sample size adopted.

In our study the most common refractive error was myopia (10.08%). A study conducted on prevalence of myopia and its associated risk factors in madrasa students in Pakistan reported similar prevalence of refractive error in such students due to prolong near work.¹⁹ This number is higher than that of a study conducted on primary school children in Lakki Marwat, where the prevalence was 2.3%.¹⁷ However, it is less as compared to another study conducted in Haripur madrasas, where myopia was 21.6% in students of 5 to 15 years of age.⁷ Another study conducted in Peshawar on school-going children, reported similar frequency of myopia to be 18.6%.¹⁸ International studies conducted in various countries such as China, Nepal and India have also reported the same prevalence of refractive error (11.07%, 11.9%, and 13.1% respectively).^{4,20,21} A possible explanation of this variance may be age differences, the difference in sampling method, definitions adopted, and differences in ethnic background.

In our study, second most common ocular morbidity was convergence insufficiency (4.62%) among female madrasa students which is comparable to a study conducted in Utar Pardesh.¹⁶ These findings are also comparable with a study conducted in Iran on students and found CI to be the second highest ocular morbidity among them.²² However, some studies had reported a higher prevalence of CI ranging from 29 % to 31.4% respectively due to different study design and diagnostic criteria of CI.^{23,24} This direct comparisons of the observed prevalence's across all the above-mentioned studies may prove challenging as they all make use of different diagnostic criteria, sample size and study design. However, the notable prevalence of CI across each study raises a definite concern.

Results from our study showed that 1.40% of our students had blepharitis. A study conducted in Lasbella Balochistan on normal schools and madrasas, also reported a similar prevalence of 1.46%.¹⁴ These results are also similar to a study conducted in India that reported 2.11% of the students had blepharitis.¹⁶ Another study from Gujrat India reported a higher prevalence of blepharitis of 15.45% among school adolescent.²⁵ Our study revealed allergic conjunctivitis to be prevalent in 1.82% children. Similar to study in from India (1.92%).¹⁶ Another study conducted in China reported a somewhat lower prevalence of 0.65%. The higher prevalence of allergic conjunctivitis in our study could be due to the spring season from March to April in our country.¹⁵ Our study reported 0.70% of bacterial conjunctivitis among female students which is comparable to a study conducted in India, which was 0.95%.¹⁶ The prevalence of squint was 0.56% in our study, which is higher than a study conducted in a local high school in Bannu, which reported a prevalence of 0.25%.¹³

Amblyopia was 0.70 % in our study, which is comparable to

a study conducted in Bannu, where amblyopia was reported as 0.75%; however their sample size was low.¹³ Similarly studies in India, Ghanna, and Tanzania reported similar prevalence of 0.41%, 0.2% and 0.5% respectively.^{16,26,27} In our study, chalazion was 0.28% which is much lower than a study conducted in Bannu they reported a prevalence of 1.3%.¹³ But these findings are comparable to a study conducted in India (0.31%).¹⁶

The results of other ocular disorders, including stye, ptosis, corneal opacity, and nystagmus, were comparable with other studies. These were not compared individually due to the small number of cases.

CONCLUSION

This study shows that ocular morbidities are common among female madrasa students in Peshawar, with refractive error being the leading cause, followed by convergence insufficiency. The majority of identified conditions were either preventable or easily treatable if detected early. These findings highlight the need for regular vision screening programs in madrassas, along with improved awareness among teachers and guardians regarding common eye problems. Early identification and timely management can help reduce avoidable visual impairment and improve the educational performance and quality of life of these students.

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Acknowledgments:

The author(s) have no acknowledgments to declare.

Conflict of Interest

The author(s) declare no conflicts of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

AI Declaration

No artificial intelligence tools were used in the preparation of this manuscript.

Patient Consent:

Informed consent was obtained from all patients involved in this study.

Ethical Approval

Ethical approval for this study was granted by Research and Ethical committee of Pakistan Institute of Community Ophthalmology, Hayatabad Medical Complex, Peshawar under reference number "008/PGS/PICO/2023."

Authors' Contribution Statement

RR: Conceptualization and design of the study, drafting, review and final approval of the final manuscript and agrees to be accountable for all aspects of the work. SN: Data acquisition, review and approval of the final manuscript and agrees to be accountable for all aspects of the work. YT: Data acquisition, review and approval of the final manuscript and agrees to be accountable for all aspects of the work. AJ: Data acquisition, review and approval of the final manuscript and agrees to be accountable for all aspects of the work.