Pakistan Journal of Positive Psychology

Pakistan Journal of Positive Psychology

Original Article

KNOWLEDGE, ATTITUDE, AND PRACTICES REGARDING EYE HEALTH AMONG MADRASA STUDENTS IN MULTAN, PAKISTAN

Sobia Safdar [a*], **Um e Habiba** [b], **& Muhammad Asif** [c]

[a] Department of Public Health, Times University, Multan, Pakistan. Email: sobiasafdar52@gmail.com

[b,c] Department of Public Health, Times University, Multan, Pakistan

*Correspondence to: Ms. Sobia Safdar, Department of Public Health, Times University, Multan, Pakistan. Email: sobiasafdar52@gmail.com

KEYWORDS:
Eye Health, Knowledge, Attitude, Practice, Refractive Errors

CITE THIS ARTICLE:
Safdar, S., Habiba, E. E., & Asif, M. (2026). Knowledge, attitude, and practices regarding eye health among madrasa students in Multan, Pakistan. Pakistan Journal of Positive Psychology, 3(8), 262-270.

ABSTRACT

Eye health is a key element of the health and wellbeing of students. The objective of this study was to evaluate the knowledge, attitude, and practice (KAP) of madrasas students of Multan, Pakistan, in eye health. A cross-sectional analytical study was done on 384 students of Madrasas ranging from 10 to 25 years of age. A structured questionnaire was used for data collection and IBM SPSS Statistics version 25 for analysis. Descriptive statistics and Pearson's chi-square test were used. A p value of < 0.05 was deemed to be significant. A total of 384 Students participated in the study, with 77.3% male and 22.7% female. The mean age was 18.58 ± 2.74 years. The mean knowledge percentage score was 49.00% (SD = 16.12), while the mean attitude and practice percentage scores were 73.81% (SD = 24.14) and 68.34% (SD = 20.45), respectively. Overall, 51.3% of respondents had moderate knowledge, regarding eye health. In addition, 58.9% had a positive attitude toward eye care. The chi-square analysis showed that there were statistically significant association between gender and attitude ($p = 0.005$), gender and practice ($p < 0.001$), educational class and attitude ($p = 0.003$) and educational class and knowledge ($p = 0.009$). But the relationships between gender and knowledge ($p = 0.070$) and educational class and practice ($p = 0.069$) were not statistically significant.

I. INTRODUCTION

Refractive errors are recognized as a significant public health issue that affects individuals worldwide (Gomez-Salazar et al., 2017). The second most common cause of treatable blindness and the most common cause of vision impairment worldwide is refractive error (RE) (BibiBergin & Geetha, 2022) Refractive errors, which include hyperopia, myopia, astigmatism, and presbyopia, are common eye disorders that cause blurry vision by preventing the eye from focusing image into the retina (Ramírez-Ortiz et al., 2023). Because the axial length of the eye ball is longer in myopia, light beams pass in front of the retina. The short axial length in hyperopia causes the image to develop behind the retina. Astigmatism causes blurry vision because the image is not formed into the retina due to the eye's unequal refractive strength in various meridians (Sume & Seyoum, 2022). High myopia is associate to ocular disorders like retinal detachment, glaucoma, and macular degeneration, which can result in irreversible visual impairment, so it's not just a refractive annoyance (Morgan et al., 2021). Uncorrected refractive error can result in binocular vision abnormalities with related asthenopia symptoms, as well as a number of other symptoms include impaired near and distance vision. Visual impairment from myopic pathologies such as glaucoma, retinal tears and detachments, as well as substantial economic and financial effects of URE have been recorded. Reduced vision-related quality of life, decreased performance and productivity, as well as loss of independence, especially amongst the elderly population are also connected with URE (Wajuihian & Mashige, 2021).

The key motivations for correcting refractive problems are to improve a patient's visual acuity, visual function, and visual comfort. One patient may benefit from having a very minor refractive defect repaired, whereas another patient may function normally and experience no negative consequences if the same very small fault is left uncorrected. In order to obtain good vision, patients with moderate to high refractive problems typically need correction (Sankaridurg et al., 2021). Eyeglasses or other refractive techniques can be used to correct refractive defects, which are easily identified during eye exams. The simplest and most economical way to reduce low vision and prevent blindness is through timely diagnosis and treatment (Steinmetz et al., 2021). According to the World Health Organization (WHO), 153 million individuals worldwide suffer from vision loss as a result of untreated refractive disease (Organization, 2013). Refractive disorder is remaining undiagnosed in less developed countries due to Various factors are supposed to be responsible, it is mainly connected to lack of knowledge and identification of the problem at a personal, family, community, and public health level (Ayanniyi et al., 2010). Visual impairment can negatively impact over all life quality, and prevent people from completing their education, obtaining a job. Wearing glasses, however, makes this problem easily manageable. Furthermore, in developing countries, regular eye checkups are uncommon because of poor awareness and inadequate resources. Thus, refractive errors are detected at late stage when patients are already visual impaired or blindness has occurred (Assefa et al., 2021). Early diagnosis and treatment of the refractive disorder are essential to inhibit low vision, blindness, and its complications. To manage the issue, adequate level of knowledge and positive perspective towards refractive disorder among students play important role to find any indication of refractive error (Alemayehu et al., 2018).

Studies have also shown that refractive errors are the most common cause of visits to ophthalmologists and other eye care specialists. According to the research currently under publication, a considerable number of Pakistani school children have refractive defects (Latif et al., 2022). Convex lenses are used in treatment to appropriately concentrate light onto the retina. When light rays from infinity focus on different focal points, it is known as astigmatism. This disease, which results in hazy vision, is caused by the asymmetric refraction of light beams via a crystalline lens or cornea (Wang et al., 2024). Numerous earlier studies examined refractive errors and the risk factors associated with them in various ethnic groups. The study revealed that the prevalence of various types of refractive errors varies depending on the age group. For example, myopia is more prevalent in the 10–29 age range, hyperopia is more common after 40, and astigmatism is less common between 6 and 90 years of age (Alqudah et al., 2023). There are a number of environmental components that may be linked to children's risk of progressing myopia, such as socioeconomic status, close work, and lack of outdoor activities (Khan et al., 2025).
Prevalence rates have risen significantly in the twenty-first century; research projections indicate that over half of the global population may be myopic by 2050 (Holden et al., 2016). The second most common cause of treatable blindness in this generation is uncorrected refractive problems. The exact scope of this issue is still unclear worldwide, with differences arising from factors including age distribution, various blindness criteria, and testing method (Alkhathami et al., 2023). An estimated 153 million people worldwide who are five years of age or older suffer from visual impairment due to uncorrected refractive defect, including 8 million blind individuals.

Despite the fact that many screening programs are conducted in schools, rates of 19.8% in Lahore, 20.43% in Kohat, and 17.24% in Southern Punjab remain insufficient (ul Hasan et al., 2025). Refractive errors are the most common problems among school-age children, especially among madrasa students who are neglected since there are insufficient school health services. A study found that 81.1% of 168 madrasas students had myopic, 7.6% hyperopic, and 11.3% astigmatic refractive abnormalities, highlighting the need to test madrassa students for potential blindness. Another cross-sectional study at Al-Shifa Trust found that 29% of 410 male madrasa students in Rawalpindi had uncorrected refractive abnormalities (Shahid et al., 2023). Outdoor activities and a family history of refractive errors were connected to refractive errors in madrassa students. After myopia, astigmatism and hyperopia were the most common refractive errors. (Rehman et al., 2022) The ancient religion-based system, called madaris, which is connected to the mosques, is used to start religious instruction for students. It promotes learning how to recite the Holy Quran (tajweed), reading it (nazira), and memorising its passages (hafiz). Madaris students' study in one crowded classroom. The books are kept on little wooden, plastic, or iron tables very close to the students' eyes as they recite them for long period of time. If these students read for long periods of time in a crowded environment, they run the risk of growing and worsening myopia (Shahid et al., 2023). In recent decades,

myopia has become much more common place globally, particularly among school-age populations (Holden et al., 2016).

Furthermore, school children's development of myopia during the COVID-19 epidemic as a result of home confinement and a decrease in outdoor activities. An increasing amount of research shows that strategies including spending more time outside and using various optical and pharmaceutical therapies can help reduce the incidence of myopia (Tian & Yu, 2025). Numerous preventive methods, including the use of glasses (single-vision, bifocal, multifocal, and peripheral aberration control), contact lenses, medication (atropine), and lifestyle changes (increasing time spent outside), have been studied and shown to be effective in managing myopia (Chaurasiya et al., 2023). A similar study found that refractive errors, a visual impairment that is thought to significant threat to both individual and society academic performance, affect one in five Pakistani high school students. (Ramachandra et al., 2016) A significant incidence of 41% in refractive errors was found in another research of students at a religious school (Madrassa) in Haripur (Atta et al., 2015). In low-resource environments, school-aged children can be affected by various eye conditions such as trachoma, conjunctivitis, allergies, injuries, Vitamin A deficiency, and congenital cataracts. Due to insufficient eye care services, many children may experience permanent vision loss, leading to significant low vision. In this context, school health initiatives can be crucial in promoting eye health, preventing issues, and ensuring the early identification and treatment of eye disorders among children. In developing nations, delivering targeted eye health education within school programs empowers children to significantly enhance the eye health of their families and communities.

The reduction in infectious diseases like trachoma has been brought about by children sharing eye health messages with their families (Habiba et al., 2017). Conjunctivitis involves inflammation and swelling of the conjunctival tissue, along with engorged blood vessels, ocular discharge, and pain (Azari & Arabi, 2020) Age-related cataract, which is defined as the progressive opacification or clouding of the eye's natural lens, is a major cause of visual disability and blindness. (Chen et al., 2025) Pterygium, also referred to as surfer's eye, is an ocular surface disease marked primarily by a wing-shaped overgrowth of limbal and conjunctival tissue onto the adjacent cornea (Shahraki et al., 2021). Trachoma is among the 20 diseases and disease groups that the World Health Organization (WHO) classifies as neglected tropical diseases. It is the most frequent infectious cause of blindness. (Solomon et al., 2022) Age-related macular degeneration is responsible for 8.7% of all blindness globally and represents the leading cause of blindness in developed nations, especially among those over 60 years of age (Guymer & Campbell, 2023). Diabetic retinopathy (DR) is the principal ocular complication of diabetes mellitus and affects roughly 30 to 40% of people with diabetes. Worldwide, over 100 million people are living with DR, and DR is a leading cause of blindness and visual impairment, particularly within the working-age adult population (Tan & Wong, 2023).

Research Objective

- To assess knowledge, attitude, and practices regarding eye health among madrasa students in Multan.

Research Questions

- What is the level of knowledge, attitude, and practices regarding eye health among madrasa students in Multan?

II. METHOD

Participants

A quantitative, analytical cross-sectional study was conducted in selected madrasas of Multan, Punjab, Pakistan in 2026. This study was designed to evaluate students' knowledge, attitudes and practices (KAP) about eye health. The study involved students aged 10-25 years studying at madrasas for a minimum of six months who were willing to participate. Students were excluded if they were outside the age range, if they had serious illnesses, or if they missed data collection. A total sample of 384 participants was included. Two-stage random sampling was used. In the first phase, the list of registered madrasas was divided into groups and madrasas were randomly selected from the list. Eligible students were randomly selected from the student list until the desired sample size was reached in the second stage.

Measures

The data were gathered using a structured questionnaire which included items on sociodemographic characteristics, knowledge of common eye diseases, attitudes towards eye care and eye health practices. The knowledge part dealt with the common eye diseases such as cataract, glaucoma, refractive errors, conjunctivitis, and other eye diseases. Eye care attitude and practice, preventive measures, timely treatment and utilization of eye care services were also evaluated. Administrative permissions were obtained prior to data collection and informed consent was obtained from participants with parental/guardian consent and student assent when under 18 years of age as required.

Procedure

Data were coded, entered and analyzed with IBM SPSS Statistics version 25. Frequencies and percentages were calculated for categorical variables, while means and standard deviations were used for continuous variables, as appropriate. Pearson's chi-square test was used to test the association of sociodemographic factors with KAP categories. A p value < 0.05 was regarded as statistically significant. Before data collection, ethical approval was given by the relevant ethics committee. All participation was voluntary and confidentiality and privacy were respected during the study.

III. RESULTS

This study aimed at assessing the awareness, demography and trend of eye problem in participants. The analysis by the participants' reported understanding of causes of blindness, gender-wise comparisons of the understanding, attitude, and practice indicators, and relationships between education class and the three indicators of eye-health status are presented. Frequencies, percentages, cross-tabulations, and Pearson’s chi-square tests were used to describe the results and examine relationships between categorical variables. There were 384 students in this study.

Socio-Demographic Characteristics of the Participants

Socio-Demographic characteristics of the participants are provided the minimum age of the participants was 11 years and the maximum age was 25 years with a mean age of 18.58 ± 2.74 years. Out of the 384 participants, 297 (77.3%) were male and 87 (22.7%) were female. As far as parents' educational background was concerned, the most common group was Uneducated (111 parents, 28.9%) followed by Primary (22, 5.7%), Middle (35, 9.1%), Matric (79, 20.6%), FSC/FA (43, 11.2%) and Graduation (BA) (37, 9.6%). 26 parents (6.8%) were post-graduated. Only 21 and 10 parents were Hafiz and Alam, respectively. The mean monthly family income of the participants was PKR 32781.25 per month.

Table I: The Demographic Background of the Participants (N=384)

Variables	Profile Category	Frequency	Percentage%
Gender	Male	297	77.3
	Female	87	22.7
Parents Education	Primary	22	5.7
	Middle	35	9.1
	Matric	79	20.6
	FA/FSC	43	11.2
	BA/Graduation	37	9.6
	Hafiz	21	5.5
	Alam	10	2.6
	Post-graduation	26	6.8
	Uneducated	111	28.9
Monthly Income (PKR)	Mean income	Max: 500,000	-
	Mean Income: 32,781.25 (SD: 51,33)	Min: 0.00	

Overall, Knowledge, Attitude, and Practice Scores

The mean knowledge percentage score was 49.00% (SD = 16.12), with scores ranging from 9.68% to 87.10%. This means that participants had an average of approximately 50% of the possible knowledge score. The mean attitude percentage score was 73.81% (SD = 24.14), ranging from 11.11% to 100%. The mean practice percentage score was 68.34% (SD = 20.45), ranging from 14.29% to 100%. Average attitude was the highest in this sample, compared to the practice and knowledge of the sample. Of the respondents, 51.3% were assigned to the moderate knowledge category, 46.4% to the poor knowledge category and 2.3% to good knowledge category, based on categories already defined in the SPSS dataset. 43.0 percent were in the moderate range, 41.7 percent in the good range and 15.4 percent in the poor range for practice. Attitude: 58.9% positive, 20.3% neutral, and 20.8% negative.

Table II: Summary of KAP Percentage Scores

Score	*M*	*SD*	Minimum	Maximum
Knowledge	49.00	16.12	9.68	87.10
Attitude	73.81	24.14	11.11	100.00
Practice	68.34	20.45	14.29	100.00

Table III: Distribution Across Existing KAP Categories

Domain	Category	Percentage
Knowledge	Poor	46.4%
Knowledge	Moderate	51.3%
Knowledge	Good	2.3%
Attitude	Negative	20.8%
Attitude	Neutral	20.3%
Attitude	Positive	58.9%
Practice	Poor	15.4%
Practice	Moderate	43.0%
Practice	Good	41.7%

Association between Gender and KAP Categories

Table IV: Chi-Square Tests for Gender and KAP Categories

Association	Pearson χ^2	df	p-value	Interpretation
Gender × Knowledge category	5.332	2	0.070	Not statistically significant
Gender × Practice category	18.528	2	<0.001	Statistically significant
Gender × Attitude category	10.658	2	0.005	Statistically significant

Association between Class Category and KAP Categories

Table V: Chi-square tests for class category and KAP categories

Association	Pearson χ^2	df	p-value	Interpretation
Class × Knowledge category	16.986	6	0.009	Significant
Class × Practice category	11.706	6	0.069	Not statistically significant
Class × Attitude category	19.858	6	0.003	Statistically significant

The chi-square analysis showed that there were statistically significant association between gender and attitude ($p = 0.005$), gender and practice ($p < 0.001$), educational class and attitude ($p = 0.003$) and educational class and knowledge ($p = 0.009$). But the relationships between gender and knowledge ($p = 0.070$) and educational class and practice ($p = 0.069$) were not statistically significant.

IV. DISCUSSION

These results can be analyzed with the results of Alemayehu et al. (2018) which studied refractive error knowledge and attitudes of primary school teachers in Ethiopia and Assefa et al. (2021) which studied knowledge and attitudes of public high school students of Gondar City regarding refractive error. While these studies have taken place in different populations and settings, they do cover the need for awareness of refractive errors. The current research has been expanded in this wider concern and proposes to improve the eye-health education at the madrasas level of education in Multan. Likewise, Ebrahim Khan et al. (2022) investigated the Knowledge, Attitude and Practice of refractive errors among the students. Their work is relevant as they deal with the same broad aspects of eye-health awareness that we do. The numerical results, however, cannot be taken as directly comparable without reading the original studies because of differences in the participants, questionnaires, scoring systems and study setting. The results of this study are significant as refractive errors such as myopia, hypermetropia and astigmatism may impact visual function and activities of daily living. Students might find it hard to see the board, read books or do educational activities without realizing their symptoms may have been caused by a correctable refractive error. The studies by Atta et al. (2015), Rehman et al. (2022), Zahra et al. (2020) and ul Hasan et al. (2025) are relevant since they were conducted among the students of madrasas of Pakistan and they were done in relation to refractive errors. They are especially useful sources for considering the eye-health needs of pupils in religious schools. The present study does not provide information about the prevalence of refractive errors among students but does contribute to the knowledge about students' awareness of refractive errors.

The study by Mansoori et al., 2024 that explored ocular morbidities in conventional school environment and madaris in Karachi is also pertinent to the broader theme of eye health in religious schools. However, knowledge of an eye problem is not the same as having the problem. Since no clinical examinations were employed in the current questionnaire-based study, it is not possible to know the exact number of those with refractive errors and those with glaucoma. The World Report on Vision (2019) published by the World Health Organization (WHO) offers an important public health context for the conversation about access to eye care, prevention, and the need for adequate eye-health services. The causes of blindness and vision loss, as well as the burden of avoidable vision loss, are also summarized from relevant background information from Steinmetz et al. (2021) (Global burden of disease). Alemayehu et al. (2018) conducted a study on knowledge and attitudes on refractive errors among primary school teachers in Ethiopia. Also, Assefa et al. (2021) examined the knowledge and attitudes of high school students on refractive errors. These studies give relevant literature that relates to the relationship between awareness and attitudes towards eye care. However, due to the different participants and context of the study, it is advisable to compare the findings with the present findings, after reading the original reports. Looking at teachers' knowledge and practices in relation to children's eye health in Rawalpindi, Pakistan, Habiba et al. (2017) offer another local example to consider when talking about children's eye health and the need to raise awareness and respond appropriately.

The results have implications for Ayanniyi et al. (2010), who studied issues, attitudes and practices of the spectacle wearers in a resource-limited setting. While spectacle use was one component of eye care, the study demonstrates the need for taking a practical approach as well as a knowledge and attitude approach. Likewise, Ebrahim Khan et al. (2022) studied knowledge, attitudes and practices in relation to refractive errors among school children, which could be used as a reference for the three components. The studies conducted by Atta et al. (2015), Rehman et al. (2022), and Zahra et al. (2020) on refractive errors among madrasas students in Pakistan also help shed light on the issue of better eye-care practices in religious educational institutions. The results were compared with previous studies conducted in Pakistan on eye health. The present study is especially relevant since it is dealing with the students of the madrasas in Multan. In this regard, in other settings of Pakistan a number of references are discussed in this thesis which have investigated refractive errors or ocular morbidity of madrasa students. Atta et al. (2015) did a study on refractive errors in the students of madrasas of Haripur and Zahra et al. (2020) did a study on refractive errors and associated factor in the students of Madrasas in Haripur District Sialkot. Rehman et al. 2022 studied the URME in male students of Madrasas in Rawalpindi. The prevalence and potential risk factors for myopia in Pakistani students at Madrasas in Madrasa were conducted by Khan et al. (2025); while Ul Hasan et al. (2025) studied refractive errors in Madrasas students of Karachi and Sukkur. Mansoori et al. (2024)

also studied the morbidity of eyes in children and adolescents going to conventional schools and madaris in Karachi. All of these studies provide a propitious research environment for the study of eye health in religious education institutes in Pakistan. Baird et al. (2020), Morgan et al. (2021) and Jonas et al. (2021) offer more background on the significance of understanding refractive errors and their prevention or management. The significance of the present study is the recognition of limited awareness and opportunities for preventive education among the students from madrasas in Multan. It supports clinical research in questions relating to whether or not students know about eye health issues and how they report going about their response to these issues.

Limitations

There was gender bias in the sample with 77.3% males and 22.7% females. The information is self-reported, meaning that there is a potential for recall bias. This research only focused on a questionnaire-based survey and did not include practical visual acuity tests or clinical eye screening to detect actual undiagnosed eye conditions.

Recommendations

Vision camps or Eye Screening camps should be organised regularly in low-income areas to reach out to families who are unable to afford a vision check-up. As the targeted population is at a young age (Mean age of 18.5 years), special educational programs should be integrated in the madrasa's health sessions regarding refractive errors, the risk of glaucoma and nutrition care.

Future Research Direction

Future researchers should develop longitudinal studies based on community design that includes both questionnaire information and real clinical screening information to accurately trace the changes in the prevalence.

V. CONCLUSION

The findings of this study are that the knowledge regarding basic eye health is very low in students. The majority of the population is unaware of the diseases which cause permanent loss of vision, such as glaucoma and refractive errors. The general attitude of the people towards eye care is very positive but due to poor awareness, coupled with low financial status, the people of the community are at high risk of visual impairment.

Disclosure Statement

No potential conflict of interest was reported by the authors.

Funding

The author received no funding from any organizations.

VI. REFERENCES

Alemayehu, A. M., Belete, G. T., & Adimassu, N. F. (2018). Knowledge, attitude and associated factors among primary school teachers regarding refractive error in school children in Gondar city, Northwest Ethiopia. *PloS one*, *13*(2), e0191199.

Alkhathami, A., Alqarni, S. A. M., Aljuaid, A. T., Alshahrani, Y. F., Alabdulminaim, J., Al-Otaibi, Y., Ibrahim, M. E., Alqarni, S. A. M., Aljuaid Sr, A. T., & Alshahrani, Y. (2023). Prevalence and patterns of refractive error among school-age children in Bisha, Saudi Arabia. *Cureus*, *15*(12).

Alqudah, A. A., Bauer, A. J., & Aleshawi, A. (2023). Refractive errors among medical students in Jordan: prevalence, types and possible risk factors. *Future science OA*, *9*(2), FSO839.

Assefa, N. L., Tegegn, M. T., & Wolde, S. Y. (2021). Knowledge and attitude of refractive error among public high school students in Gondar City. *Clinical optometry*, 201–208.

Atta, Z., Arif, A. S., Ahmed, I., & Farooq, U. (2015). Prevalence of refractive errors in Madrassa students of Haripur district. *Journal of Ayub Medical College Abbottabad*, *27*(4), 850–852.

Ayanniyi, A. A., Adepoju, F. G., Ayanniyi, R. O., & Morgan, R. E. (2010). Challenges, attitudes and practices of the spectacle wearers in a resource-limited economy. *Middle East African journal of ophthalmology*, *17*(1), 83–87.

Azari, A. A., & Arabi, A. (2020). Conjunctivitis: a systematic review. *Journal of ophthalmic & vision research*, *15*(3), 372.

Baird, P. N., Saw, S.-M., Lanca, C., Guggenheim, J. A., Smith III, E. L., Zhou, X., Matsui, K.-O., Wu, P.-C., Sankaridurg, P., & Chia, A. (2020). Myopia. *Nature reviews Disease primers*, *6*(1), 99.

BibiBergin, R., & Geetha, P. (2022). Evaluation of knowledge attitude and practice towards refractive errors and its impact among healthy volunteerBibiBergin, R., & Geetha, P. (2022). Evaluation of knowledge attitude and practice towards refractive errors and its impact among healthy volunteers in urban and rural areas of Kanyakumari district. *International Journal of Health Sciences*(III), 4412–4427.

Chaurasiya, R. K., Sutar, S., Gupta, A., Pandey, R., & Agarwal, P. (2023). Knowledge, attitude, and practice of childhood myopia among Indian optometrists: A questionnaire-based study. *Indian journal of ophthalmology*, *71*(3), 951–956.

Chen, S. P., Woreta, F., & Chang, D. F. (2025). Cataracts: a review. *Jama*, *333*(23), 2093–2103.

Ebrahim Khan, N., Mahomedy, M., Mngadi, L., Moola, Z., Moosa, Z., Ndwandwe, G., & Ntombela, A. S. (2022). Knowledge, attitudes and practices towards refractive error amongst students. *African Vision and Eye Health*, *81*(1), 633.

Gomez-Salazar, F., Campos-Romero, A., Gomez-Campaña, H., Cruz-Zamudio, C., Chaidez-Felix, M., Leon Sicairos, N., Velazquez-Roman, J., Flores-Villaseñor, H., Muro-Amador, S., & Guadron-Llanos, A. M. (2017). Refractive errors among children, adolescents and adults attending eye clinics in Mexico. *International Journal of ophthalmology*, *10*(5), 796.

Guymer, R. H., & Campbell, T. G. (2023). Age-related macular degeneration. *The Lancet*, *401*(10386), 1459–1472.

Habiba, U., Ormsby, G. M., Butt, Z. A., Afghani, T., & Asif, M. (2017). Knowledge and practices of teachers associated with eye health of primary school children in Rawalpindi, Pakistan. *Taiwan Journal of Ophthalmology*, *7*(1), 28.

Jonas, J. B., Ang, M., Cho, P., Guggenheim, J. A., He, M. G., Jong, M., Logan, N. S., Liu, M., Morgan, I., & Ohno-Matsui, K. (2021). IMI prevention of myopia and its progression. *Investigative ophthalmology & visual science*, *62*(5), 6–6.

Khan, S., Shah, M., Jan, S., Hassan, J., & Khan, A. (2025). Frequency of Myopia and its Associated Risk Factors among Madrassa Students in Pakistan. *Pakistan Journal of Ophthalmology*, *41*(3).

Latif, M. Z., Hussain, I., Afzal, S., Naveed, M. A., Nizami, R., Shakil, M., Akhtar, A. M., Hussain, S., & Gilani, S. A. (2022). Impact of refractive errors on the academic performance of high school children of Lahore. *Frontiers in public health*, *10*, 869294.

Mansoori, N., Mubeen, S. M., & Fatmi, S. I. A. (2024). Frequency of Ocular Morbidities among Children and Adolescents in Conventional and Religious School (Madaris) of Karachi, Pakistan. *Journal of Society of Prevention, Advocacy and Research King Edward Medical University*, *3*(4), 71–75.

Morgan, I. G., Wu, P.-C., Ostrin, L. A., Tideman, J. W. L., Yam, J. C., Lan, W., Baraas, R. C., He, X., Sankaridurg, P., & Saw, S.-M. (2021). IMI risk factors for myopia. *Investigative ophthalmology & visual science*, *62*(5), 3–3.

Ramachandra, K., Gilyaru, S., Eregowda, A., & Yathiraja, S. (2016). Prevalence of refractive error and the eye morbidity in school children in Bangalore, India. *Int J Contemp Pediatr*, *3*(1), 138–141.

Ramírez-Ortiz, M. A., Amato-Almanza, M., Romero-Bautista, I., Klunder-Klunder, M., Aguirre-Luna, O., Kuzhda, I., Resnikoff, S., Eckert, K. A., & Lansingh, V. C. (2023). A large-scale analysis of refractive errors in students attending public primary schools in Mexico. *Scientific Reports*, *13*(1), 13509.

Rehman, A. U., Sughra, U., Kausar, S., Riaz, A., & Suleman, M. (2022). Uncorrected Refractive Error among Male Students of Madrassas in Rawalpindi–Pakistan. *Pakistan Journal of Ophthalmology*, *38*(2).

Sankaridurg, P., Tahhan, N., Kandel, H., Naduvilath, T., Zou, H., Frick, K. D., Marmamula, S., Friedman, D. S., Lamoureux, E., & Keeffe, J. (2021). IMI impact of myopia. *Investigative ophthalmology & visual science*, *62*(5), 2–2.

Shahid, S., Rauf, S. A., Dastgir, S., Ali, F., Saifullah, R., & Fatima, U. (2023). Association of asthenopia with refractive errors in madrassa students. *Khyber Medical University Journal*, *15*(2), 101–105.

Shahraki, T., Arabi, A., & Feizi, S. (2021). Pterygium: an update on pathophysiology, clinical features, and management. *Therapeutic advances in ophthalmology*, *13*, 25158414211020152.

Solomon, A. W., Burton, M. J., Gower, E. W., Harding-Esch, E. M., Oldenburg, C. E., Taylor, H. R., & Traoré, L. (2022). Trachoma. *Nature reviews Disease primers*, *8*(1), 32.

Steinmetz, J., Bourne, R., Briant, P., Flaxman, S., Taylor, H., & Jonas, J. (2021). GBD 2019 Blindness and Vision Impairment Collaborators; Vision Loss Expert Group of the Global Burden of Disease Study. Causes of blindness and vision impairment in 2020 and trends over 30 years, and prevalence of avoidable blindness in relation to VISION 2020: the Right to Sight: an analysis for the Global Burden of Disease Study. *Lancet Glob Health*, *9*(2), e144–e160.

Sume, B. W., & Seyoum, G. (2022). Prevalence of refractive errors among school students in Ethiopia: a systematic review and meta-analysis. *SAGE Open Medicine*, *10*, 20503121221127096.

Tan, T.-E., & Wong, T. Y. (2023). Diabetic retinopathy: Looking forward to 2030. *Frontiers in endocrinology*, *13*, 1077669.

Tian, Y., & Yu, Y. (2025). Knowledge, attitude and practice towards myopia among parents of primary school students: a cross-sectional study. *BMJ Open*, *15*(3), e093565.

ul Hasan, M., Alkhairy, S., & Akram, N. (2025). Prevalence of Refractive Errors among the Madrassah Students of Karachi and Sukkur. *Pakistan Journal of Medical Research*, *64*(4), 177–181.

Wajuihian, S. O., & Mashige, K. P. (2021). Gender and age distribution of refractive errors in an optometric clinical population. *Journal of Optometry*, *14*(4), 315–327.

Wang, Y., Li, L., Tang, X.-L., Guo, G.-L., Chen, M.-W., Cha, L.-L., Liao, J.-Y., & Zou, Y.-C. (2024). Characteristics of astigmatism in school-age children aged 5 to 13 years in northeast Sichuan: a cross-sectional school-based study. *Translational Pediatrics*, *13*(7), 1130–1140.

World Health Organization. (2013). *Responding to intimate partner violence and sexual violence against women: WHO clinical and policy guidelines*. World Health Organization.

Zahra, T., Hussain, I., Munawar, S., Baig, S., & Bokhari, N. M. (2020). Prevalence of refractive errors and the factors related to it among madrassa students in district Sialkot. *The Professional Medical Journal*, *27*(01), 143–151.