ORIGINAL ARTICLE

Knowledge and Practice Trends of Optometrists and Refractionists at LRBT Regarding Myopia

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Abstract:

Objectives: To assess the Knowledge and Practice trends of optometrists and refractionists working at various eye care facilities of Layton Rahmatullah Benevolent Trust (LRBT) on myopia management and control.

Methods: A questionnaire-based online survey was conducted, which took 6 weeks to conclude. The participants' responses comprised their current trends towards the management of childhood myopia, knowledge & awareness level concerning modern concepts of myopia control strategies, and the extent of applicability of control measures in their practices.

Results: 105 professionals including 57 optometrists and 48 refractionists participated in the survey. Almost 50% of the participants were unaware of the current myopia control strategies. 75% of participants didn't attend any course or CME (Continuing Medical Education) session about current myopia management and control. The majority of participants (65%) considered myopia > 1D annual progression alarming for initiation of myopia control measures. Moreover, 67% were unaware of the significance of outdoor activity for myopic children. About 85% of participants were under-correcting myopic children to slow down myopia progression. Most respondents (69%) were not measuring the Axial Length of myopic children in their practice. More than 50% were neither testing binocular vision nor assessing accommodation lag. Furthermore, around 55% were not performing baseline fundus examination, whereas 64% considered pathological myopia > 6D as the standard criteria for peripheral fundus examination.

Conclusion: The responses of participants to survey questions reveal inadequacy in knowledge and practice concerning current myopia management and control strategies. *Al-Shifa Journal of Ophthalmology 2023; 19(4): 162-171. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

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Introduction:

Myopia has stood out as a significant health problem owing to the considerable increase in its prevalence across the globe. It has been projected to affect almost 50% of the world population by the year 2050.[1]. This alarming situation has aroused curiosity amongst eye care professionals to adequately control its progression. The rationale for slowing down myopia progression is to minimize the probability of significant vision loss due to sight-threatening complications later in life.

Myopia has been attributed as the most common cause of distant vision impairment in the working age group. Because of global myopia spillover, it is envisaged that more children will develop myopia and subsequently progress to high myopia if adequate control measures are not

employed. As a result, a significant proportion of high myopes are expected to suffer from visual morbidity due to the eventual, higher prevalence of myopic complications in the population. This is because of the increased risk of developing complications with age and progression of the refractive error.[2] Moreover, since both environmental and genetic factors have been regarded to cause myopia and its progression, a greater risk of developing myopia is anticipated among the children of myopic parents.

Myopia initially causes visual impairment due to uncorrected refractive error. However, if control strategies to slow down its progression are not employed, it can lead to an increased risk of sight-threatening complications including but not limited to open-angle glaucoma, retinal detachment, and myopic macular degeneration (MMD), thereby reducing the quality of life.[3] The central vision loss due to MMD is irreversible and an increase in axial length in high myopia is the major contributing factor for increasing the risk of MMD.[4]

The introduction of newer myopia control strategies in clinical practice should be deliberated as a priority agenda, as according to a study, any lapse in this execution may lead to visual impairment due to MMD in 55.7 million people out of which 18.5 million will be blind by the year 2050.[5]

Given that outdoor activity has an eminent role in the prevention of onset and slowing down the progression of myopia, it is also accepted that there exists a positive association of excessive near work with myopic progression[6,7]. This indicates that environmental and lifestyle changes can be utilized by eye care professionals as an effective tool in myopia management.[8] Furthermore, parents of myopic children should be made aware of myopia progression and its management to address the issue from a broader perspective.

The goal of employing myopia control strategies should be to slow down the progression of myopia and in turn, minimize the occurrence of consequent sight-threatening complications. A number of these control strategies including the use of bifocals and multifocal lenses, atropine therapy, orthokeratology, and soft contact lenses have been established as significantly effective.[6] Substantial evidence is now available to validate that the conventional practice of under-correcting myopia leads to faster progression of the refractive error. This critical situation urges for the adoption of best practices by eye care practitioners for myopia management.

Layton Rahmatullah Benevolent Trust (LRBT) is present in all 4 provinces of Pakistan, with a network of 19 fully-equipped hospitals, 61 primary eye care, and outreach clinics. This study explores the awareness level and strategies being practiced for managing myopia and its progression by optometrists and refractionists at LRBT.

Materials and Methods:

A questionnaire-based online survey was conducted, including optometrists and refractionists deployed at various eye care facilities of LRBT. Whereas, other eye care professionals, i.e., ophthalmologists, orthoptists, and ophthalmic technologists were excluded. The questionnaire comprised survey questions regarding knowledge and practice trends of the study participants about myopia management and control. Data entry and analysis were done using SPSS software.

Results:

105 professionals including 57 optometrists and 48 refractionists working at various eye care facilities of LRBT participated in the survey. Based on years in practice; 52 (50%) had less than 5 years, 39 (37%) had between 5-10 years, and 14 (13%) had more than 10 years of experience.

50 (48%) survey participants were unaware of the current myopia control strategies.

Only 27 (25%) had so far attended the myopia course, conceptualizing current

myopia management and control measures, whereas 75% of survey participants had not attended any CPD(continuing professional development) session in this regard (Fig 1). The preferred method of refraction was cycloplegic, whether using retinoscopy (52%) or the auto-refractometer (53%), most of the optometrists and refractionists (n=89; 85%) tended to under-correct, for slowing down myopia progression (Fig 2).
Of the participants,72 individuals (69%) were not measuring the axial length of myopic children in their practice (Fig 3).
A few participants (n=42, 40%) were highly concerned about rapid paediatric myopia progression in their clinical practice but the rest including 38 (36%) and 25 (24%) individuals, were somehow or not at all concerned respectively about rapid myopia progression in their paediatric patients. (Fig 4).
The majority of optometrists & refractionists (n=37; 65% & n=31; 65% respectively) considered annual myopia progression > 1D as an alarming sign for initiation of myopia control management. 58 (55%) participants were not performing baseline fundus examination (Fig 5). The preferred initial concentration of atropine was 0.01% amongst 43 (41%) participants.
After initiation of myopia control, 48 (38%) participants were reviewing patients on 3-monthly follow-ups while 65 (62%) were following them biannually, i.e., 6 monthly.
69 participants (67%) were unaware of the significance of outdoor activity in myopia control (Fig 6), whereas most optometrists and refractionists (n=60; 57%) responded considering < 2 hours, the acceptable continuous near work time for myopic patients.
77 participants (73%) were not prescribing bifocal glasses, progressive glasses, or contact lenses (singly or in combination) for controlling myopia progression in children (Fig 7).

Table 1: Knowledge and awareness regarding Myopia control and management

S. N	Critical Aspects of Myopia Management & Control	Response n (%)	Details
1.	Awareness regarding myopia control strategies	Aware: 55 (52%) Unaware: 50 (48%)	Almost 50% of participants were unaware of the current myopia control strategies
2.	Attended or haven't yet attended any training course about current myopia management and control strategies	Attended: 27 (25%) Not attended: 78 (75%)	75% of participants had not attended any CME session about current myopia management and control strategies
3.	Awareness about the annual alarming progression of Myopia.	Aware: 37 (25%) Un-aware: 68 (65%)	Most participants (65%) were unaware of the annual alarming progression rate of myopia, i.e. ≥ 0.50 D
4.	Awareness about suggesting outdoor activities for myopic children.	Aware: 36 (33%) Un-Aware: 69 (67%)	67% of participants were unaware of the significance of outdoor activity for myopic children.
5.	Awareness about acceptable continuous near-work time for myopic children.	Aware: 60 (57%) Un-aware:	57% of responses were accurate, i.e., the acceptable continuous near-work time should be < 2 hours.

Table 2: Practice trends of participants pertaining to Myopia control and management

S. N	Critical Aspects of Myopia Management & Control	Response n (%)	Details
1.	Preferred Method of refraction in pediatric myopic patients	Cycloplegic refraction with Retinoscopy: 49% Cycloplegic ref with Autorefractor: 51%	The preferred method of refraction amongst survey participants was cycloplegic refraction whether with retinoscopy (49%) or auto refraction (51%)
2.	Under-correction as a strategy to slow down myopia progression	Yes: 89 (85%) No: 16 (15%)	85% of participants were under correcting the myopic children to slow down myopia progression
3.	Axial length measurement	Yes: 33 (31%) No: 72 (69%)	The majority of participants (69%) do not measure the axial length of myopic children in their practice.
4.	Binocular vision testing and assessment of accommodation lag.	Yes: 51 (49%) No: 54 (51%)	More than 50% of participants were neither testing binocular vision nor assessing accommodation lag.
5.	Level of concern about the rapid progression of pediatric myopia in clinical practice	Extremely: 42 (40%) Somehow: 38 (36%) Not at all: 25 (24%)	The positive responses regarding extreme concern about rapid progression of pediatric myopia were 42%.
6.	Baseline fundus examination with direct ophthalmoscope including criteria for peripheral fundus examination	Yes: 47 (45%) No: 58 (55%)	55% do not perform baseline fundus examination, whereas 64% consider pathological myopia (> 6D) as the standard criteria for peripheral fundus examination.
7.	Typical starting concentration of atropine for myopia control	0.1 % = 40 (39%) 0.05%= 22 (20%) 0.01%= 43 (41%)	41% were using 0.01% as the starting concentration of Atropine, whereas another 39% were using 0.1% as the starting Atropine concentration for myopia control.
8.	Follow-up for myopic patients	3 monthly: 40 (38%) 6 monthly: 65 (62%)	62% were advising follow-up after every 6 months, which is the recommended approach.
9.	Employing various treatment modalities singly or in combination	Yes: 19 (33%) No: 38 (67%)	67% did not prescribe different treatment modalities like (bifocal glasses, progressive glasses/contact lenses, or orthokeratology) either singly or in combination to control myopia progression in children.

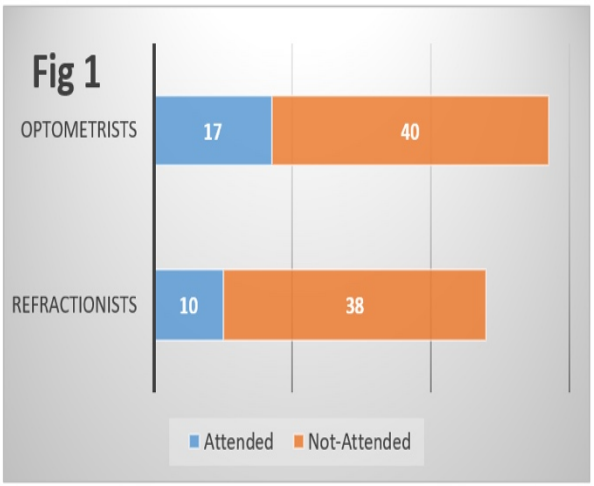

Figure 1: Distribution of participants who had or had not attended any myopia management course

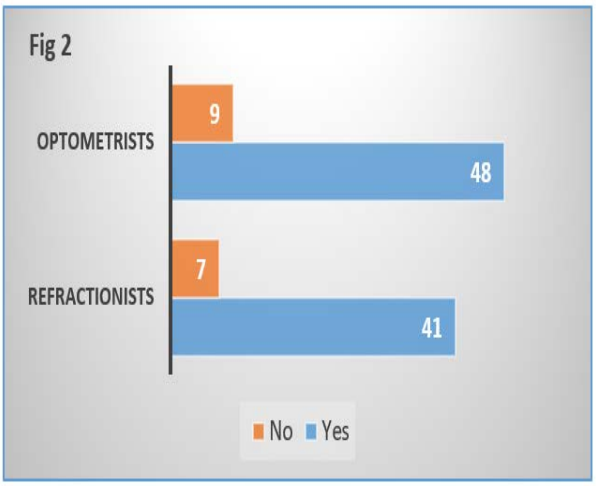

Figure 2: Proportion of participants practicing under-correction as a strategy to slow myopia progression

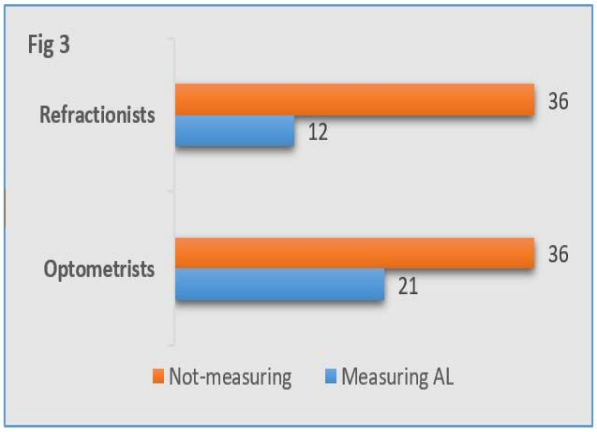

Figure 3: Proportion of participants measuring and not measuring axial length in myopic patients

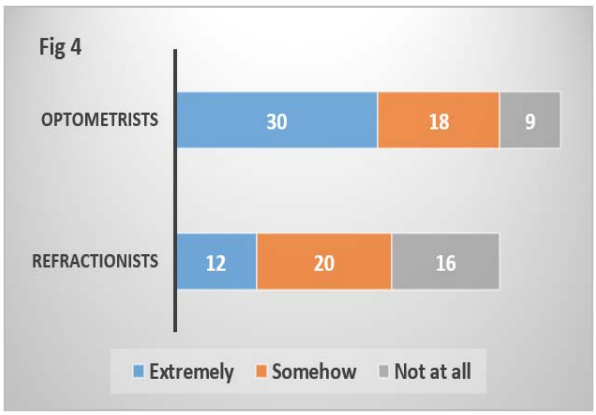

Figure 4: Illustrates the level of concern expressed by participants regarding rapid progression of paediatric myopia

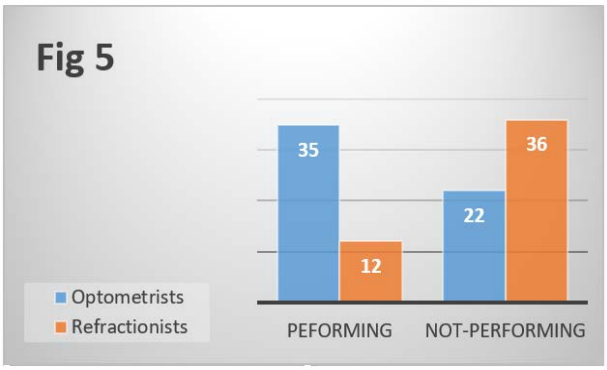

Figure 5: Displays the proportion of study participants who performed or did not perform baseline fundus examination of myopic patients

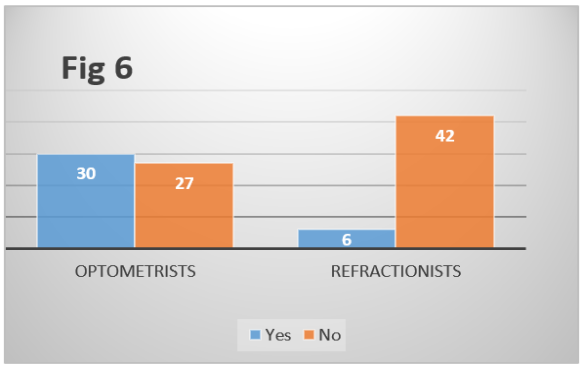

Figure 6: Depicts no of participants who suggested or did not suggest out-door activity

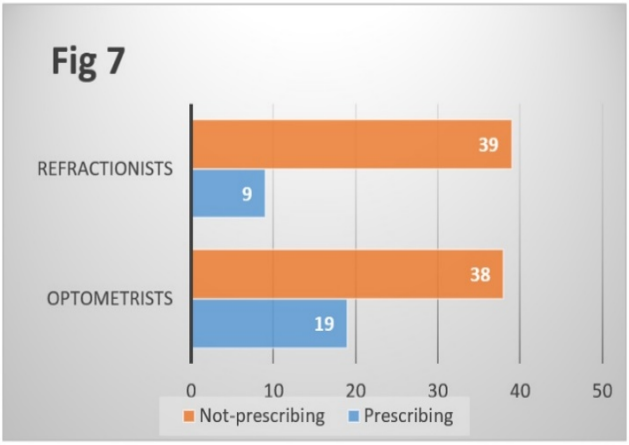

Figure 7: Proportion of participants prescribing or not prescribing treatment modalities for controlling myopia progression

Discussion:

The purpose of this survey was to assess the knowledge and practice trends of optometrists and refractionists working at various LRBT eye care facilities (primary, secondary & tertiary) about current myopia management and control strategies. The findings highlight the dire need for enhancing knowledge and awareness amongst both categories of participants pertaining to these aspects. However, an important barrier for not putting into practice some of the myopia control strategies, especially at the primary level eye care facilities of LRBT was the unavailability of either myopia progression diagnostic equipment, i.e., A-Scan & refractor-Keratometer, or treatment modalities like progressive glasses, multifocal contact lenses, and low concentration atropine.

The preferred method of refraction amongst survey participants was cycloplegic refraction whether with retinoscopy (49%) or autorefraction (51%). Cycloplegic refraction is considered the standard approach for measuring refractive error in children. Skipping cycloplegia usually results in an overestimation of the degree of myopia in children[9].

Previously, under-correcting myopia was practiced as a conventional approach to slow down myopia progression by diminishing the accommodative demand. However, substantial evidence attributes under-correction as a significant factor for myopia progression as against full correction of myopic eyes[10,11,12]. However, in our study, 85% of all participants were under-correcting myopia in their practice.

There exists a high correlation between axial length change and myopic progression, i.e., the longer the axial length the higher the degree of myopia[13], hence axial length should essentially be measured and monitored while assessing the effect of myopia control strategies on ocular changes. According to survey findings, 69% of participants were not measuring axial length. This finding reflects the inaccessibility of optometrists and refractionists working at LRBT's primary eye care facilities to expensive biometry equipment.

59% of participants were not performing baseline fundus examination, whereas this should be done as a routine to assess the progression of retinal degenerative changes or choroidal thickness corresponding to any further increase in myopia. Studies suggest a high association between refractive error (spherical equivalent) and myopia-related peripheral retinal changes. Fundus examination reveals such changes, which helps practitioners in managing myopia and

planning for different treatment strategies accordingly[14,15,16].

64% of practitioners consider pathological myopia > 6D as a benchmark for peripheral fundus examination, which is not in conformity with the standard practice. According to a study conducted in India, various pathologic features of myopia were found across all grades of myopia indicating that pathologic myopia lesions also exist in eyes with low degrees of myopia (2.5% in low myopes vs. 2.2% in severe myopes). Lattice degeneration was the most frequently seen lesion (2.7%)[17].

In Myopes, Atropine therapy is offered to slow down progression. The majority of respondents (41%) in our study considered 0.01% atropine as a typical starting concentration for myopia control. However, 1-year follow-up data from the Low-Concentration Atropine for Myopia Progression (LAMP) study, which was a double-masked placebo-controlled trial, has questioned the efficacy of 0.01% topical Atropine, relative to a 0.05% concentration, for slowing axial elongation[18].

67% of study participants were unaware of the significance of outdoor activity in myopia control. Sufficient evidence reveals the positive impact of outdoor activity on lowering the incidence of myopia. It has been observed that spending time outdoors and sunlight exposure protects against myopia progression, however, the underlying mechanism of this protective effect has not yet been fully understood. Hence, an increased span of outdoor activity may result in considerable protection against myopia progression, and studies carried out involving school-aged children have recommended a minimum of 8 to 15 hours of outdoor activity per week to achieve clinically significant protective effects[19-22].

57% of respondents considered < 2 hours as the acceptable continuous near-work time for myopic patients. Long continuous near work time can be a contributing factor to the development and progression of myopia. Continuous reading for more than 45 minutes at a close distance (20 cm) has been deemed as a greater risk for myopic progression. Children should be educated about regular breaks (near-to-distance fixation changes) every 20 minutes for 20 seconds and maintaining appropriate reading distance (30 to 40 cm) while reading or spending time on screens[23,24].

More than two-thirds of participants (73%) were not prescribing bifocal glasses, progressive glasses, or contact lenses (singly or in combination) for controlling myopia progression in children. The most probable reason might be the high cost of these treatment modalities. Thus, according to survey findings, single-vision glasses had been the mainstay strategy for myopia control. Almost similar findings were observed in a study conducted in 2015 for investigating myopia management and control trends in Asia, Australia, Europe, North America, and South America[25]. The study was carried out again later between the years 2018 and 2019 and it was noticed that prescribing single vision glasses for myopic children was still the primary approach amongst eye care professionals (64%)[26].

The majority of participants considered > 1D annual progression alarming for initiation of myopia control as against 1/3rd of respondents, who advocated 0.75 or 0.50 diopter annual progression as a threshold to initiate control measures. Recent studies suggest that myopia control strategies should urgently be employed for children who become myopic at a younger age to reduce the complications associated with myopia progression [27,28.]

Regarding myopia related CPD activities, most (75%) have not yet attended any myopia management course, which suggests that the knowledge and practices of a considerable proportion of optometrists and refractionists are not up to the mark concerning the current concepts of myopia management and control.

Conclusion:

The responses of participants relating to the majority of survey questions reveal inadequacy in knowledge and practice concerning current myopia management and control strategies, which highlights the need to make them aware of these concepts through in-house CPD activities.

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Critical Revision: Muhammad Nadeem