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A STUDY ON EVALUATION OF PREVALENCE OF OCULAR MORBIDITIES IN CHILDREN OF 6-14 YEARS OF AGE

Ophthalomology

Dr Manjula Mangane M.S. Ophthalmology, Professor and HOD, Department of Ophthalmology, Mahadevappa Rampure Medical College, Kalaburagi, Karnataka, India.

Dr Syeda Mehnaaz Iram* Postgraduate in Ophthalmology, Mahadevappa Rampure Medical College, Kalaburagi, Karnataka, India. *Corresponding Author

ABSTRACT

Context: Ocular morbidities, particularly refractive errors, are highly prevalent in children. Studies have shown prevalence rates as high as 30% in some populations. Refractive errors, such as myopia and astigmatism can significantly impact a child's vision, leading to difficulties in learning, reduced academic performance, and impaired social interactions if left untreated." **Aim-** The aim of this study was to evaluate the prevalence of ocular morbidities in children aged 6-14 years. **Settings And Design:** This prospective hospital-based study evaluated children aged between 6- 14 years for ocular morbidities. After inclusion and exclusion criteria were applied a total of 200 students were enrolled into the study. **Materials And Methods:** This prospective observational study, conducted at a hospital, is to look into ocular morbidities in children aged 6 to 14. This study was carried out at the Department of Ophthalmology, Basaveshwar Teaching and General Hospital (BTGH), affiliated with Mahadevappa Rampure Medical College in Kalaburagi, over an 18-month period from August 1, 2022, to January 31, 2024. **Statistical Analysis Used:** Simple descriptive statistics. **Results:** Females constituted the majority of the study population (55%). Blurred vision was the most common presenting complaint (40%). Ocular morbidity was observed in 80% of the children, with refractive errors being the most common (30%). Simple Myopic Astigmatism (SMA) (41.7%) was the most prevalent refractive error. A significant association was found between ocular morbidities and age ($p=0.0263$), and gender ($p=0.033$). Furthermore, refractive errors showed significant associations with a family history of refractive errors ($p<0.001$), increased screen time ($p<0.001$ for video games; $p=0.0045$ for TV watching), and decreased outdoor activity ($p=0.0023$). **Conclusion:** This study highlights the significant prevalence of ocular morbidities among children aged 6 to 14 years, with refractive errors being the most common condition observed. These findings emphasize the importance of early detection and intervention for ocular issues to prevent blindness and long-term vision impairments.

KEYWORDS

School children, ocular morbidities, refractive errors

INTRODUCTION

Childhood ocular morbidities, ranging from refractive errors to more severe conditions like cataracts and glaucoma, pose a significant public health challenge. These visual impairments can develop early in life and, if left untreated, may lead to long-term consequences such as blindness, profoundly affecting a child's development and quality of life. According to the World Health Organization (WHO), approximately 19 million children worldwide are visually impaired, with around 12 million suffering from refractive errors alone. [1, 2]

The causes of ocular morbidities in children are multifactorial, including genetic predispositions, perinatal complications, nutritional deficiencies, infections, and trauma. Environmental factors, such as prolonged screen exposure and inadequate access to eye care services, also play a critical role. Children aged 6 to 14 years, a critical period for physical, cognitive, and emotional development, are especially vulnerable to ocular issues.[2] Vision problems during this phase can significantly impact academic performance, social interactions, and overall well-being. The most prevalent eye disorders among schoolchildren include refractive errors, squint, vitamin A deficiency, and infections, with uncorrected refractive errors being particularly widespread in developing countries like India. These errors contribute substantially to childhood blindness, which is preventable through early detection and treatment. [3, 4]

Ocular morbidities in children emphasize the need for early intervention. Poor eyesight hinders education and employment, highlighting the importance of comprehensive eye health programs.[5] Preventing blindness and improving eye health in schoolchildren requires proactive detection and treatment of these conditions. This study examines ocular morbidities and their causes in children aged 6 to 14 years.

MATERIALS AND METHODS

Study Design And Setting

This was a hospital-based, prospective observational study aimed at investigating ocular morbidities among children aged 6 to 14 years. The study was conducted at the Department of Ophthalmology, Basaveshwar Teaching and General Hospital (BTGH), affiliated with Mahadevappa Rampure Medical College in Kalaburagi, over an 18-month period from August 1, 2022, to January 31, 2024. BTGH, with its regular inflow of patients seeking ocular care, provided an ideal setting for a focused examination of ocular conditions in children.

Study Population

Children aged between 6 to 14 years who visited the outpatient department of the Department of Ophthalmology at BTGH during the study period were included in the study. The inclusion criteria consisted of children in the specified age range who were diagnosed with ocular morbidities such as refractive errors, strabismus, ptosis, ocular trauma, and eye infections. Exclusion criteria included children with previous ocular surgeries, those diagnosed with ocular malignancies, and those whose guardians did not provide informed consent.

Sampling Method

Simple random sampling was employed to recruit participants, ensuring that each child who met the inclusion criteria had an equal chance of being included. A sample size of 200 participants was determined using a prevalence-based formula. The prevalence of ocular morbidity in children under 17 years in eastern India was considered to be 45.92%, with an allowable error of 6.89%. The calculated sample size was 198.71, which was rounded up to 200.

Clinical Examination

A comprehensive clinical examination was performed for each participant, which included the following tests:

- Snellen chart visual acuity tests
- Cycloplegic refraction
- Ishihara color blindness tests
- Hirschberg and Cover-Uncover tests for squint
- Detailed ocular examinations were conducted using slit-lamp biomicroscopy and direct ophthalmoscopy.

Data Collection And Ethical Considerations

A systematic data gathering form was used to record demographic information, medical history, and clinical findings. Informed written consent was obtained from parents/guardians in their native language. Additionally, age-appropriate verbal assent was obtained from children aged 6 years and above after explaining the procedures in simple, understandable language. The study protocol was approved by the institutional ethics committee to ensure patient privacy and ethical compliance.

Data Analysis

Data analysis was performed using IBM SPSS 20.0. Quantitative data

were analyzed using t-tests, and qualitative data were analyzed using chi-square tests. A p-value of less than 0.05 was considered statistically significant. All p-values are reported in standard format, with values less than 0.001 reported as p<0.001.

RESULTS:

A total of 200 children aged 6 to 14 years who presented with ocular complaints were included in this study.

Demographic Characteristics:

The study population was fairly distributed across different age groups. The majority of participants were aged 14 years (21.5%). In terms of gender, there were more females (55%) than males (45%), indicating a slight female predominance in the sample.

The majority of children in the study came from nuclear families, accounting for 91.5% (183 participants), while only 8.5% (17 participants) were from joint families. In terms of parental education, 51.5% (103 parents) had no formal education, 26% (52 parents) had completed primary education, 11% (22 parents) had middle school education, 10% (20 parents) had completed high school, and only 1.5% (3 parents) were graduates. Most of the fathers (49%) were employed in semi-skilled positions, and the rest 46.5% and 4.5% of fathers were in unskilled and skilled occupations, respectively. Majority of the mothers were homemakers (70.5%), while the rest 29.5% were working.

Clinical Characteristics

Most common presenting symptom observed in present study was blurred vision (40%), followed by headaches (30%). Distribution of symptomatology is shown in *Fig. 1.* 160 students (80%) out of the 200 students were observed to have ocular morbidity, while the remaining 20% were normal. This suggests high prevalence of ocular morbidity in school children.

Refractive errors were the most common ocular morbidity, affecting 30% of participants. The distribution of various ocular morbidities is shown in *Table 1.* Simple myopia was the most common refractive error, observed in 12 out of 48 students (25%). The distribution of type of refractive errors has been shown in *Table 2.*

Association Of Demographic Factors

(Table 3) Present study revealed significant associations between ocular morbidities and several demographic factors. Age was significantly associated with the presence of ocular morbidity (p = 0.0263), with older children, particularly those aged 8-9 years, showing higher rates of ocular morbidity. Gender was also a significant factor, with females exhibiting a higher prevalence of ocular morbidity than males (41% vs. 39%, p = 0.033).

Furthermore, increased screen time, such as time spent playing video/mobile games and watching TV, showed strong associations with refractive errors. Children who spent more than one hour on such activities had significantly higher rates of refractive errors (p < 0.001). Time spent outdoors was inversely associated with the prevalence of refractive errors; with children engaging in less outdoor activity were more likely to develop these issues (p = 0.0023).

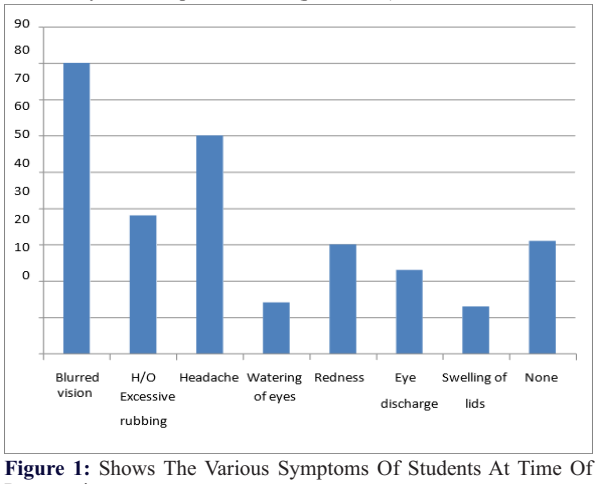

Figure 1: Shows The Various Symptoms Of Students At Time Of Presentation

Table 1: Distribution Of Ocular Morbidities

Ocular Morbidity	Frequency
Refractive error	48 (30%)
Blepharitis	20 (12.5%)
Conjunctivitis	12 (7.5%)
Stye	16 (10%)
Vitamin A deficiency	8 (5%)
Corneal opacity	4 (2.5%)
Ocular trauma	8 (5%)
Ptosis	4 (2.5%)
Chronic Progressive External Ophthalmoplegia (CPEO)	4 (2.5%)
Squint	20 (12.5%)
Amblyopia	16 (10%)
Total	**160**

Table 2: Distribution Of Types Of Refractive Errors

Types of Refractive error	Frequency
Simple Myopia	12 (25%)
Simple Myopic Astigmatism (SMA)	20 (41.7%)
Compound Myopic Astigmatism (CMA)	4 (8.3%)
Simple HM (Simple Hyperopia)	4 (8.3%)
Simple Hyperopic Astigmatism (SHA)	4 (8.3%)
Mixed astigmatism	4 (8.3%)
Total	48

Table 3: Demographic Characteristics And Their Association With Presence Of Refractory Errors

Demographic characteristic		Frequency	Refractory Errors		
			Present (n = 48)	Absent (n= 152)	P value
Age group	6-7 years	34 (17%)	4 (2%)	30 (15%)	0.191 (not significant)
	8-9 years	42 (21%)	8 (4%)	34(17%)	
	10-11 years	40 (20%)	8 (4%)	32 (16%)	
	12-13 years	41 (20.5%)	12(6%)	29(14.5%)	
	14 years	43 (21.5%)	16 (8%)	27 (13.5%)	
Gender	Males	90 (45%)	12 (6%)	78(39%)	0.151 (not significant)
	Females	110 (55%)	36(18%)	74(37%)	
History of presence of refractive errors in family	Fathers	30(15%)	12(6%)	18 (9%)	<0.001 (significant)
	Mother	40(20%)	12 (6%)	28 (14%)	
	Both parents	25(12.5%)	20 (10%)	5(2.5%)	
	Siblings	34(17%)	32(16%)	2 (1%)	
	None	105 (52.5%)	4(2%)	101 (50.5%)	
Time spent on playing video games	30 minutes	30(15%)	8(1%)	22(14%)	<0.001 (significant)
	1 hour	52(26%)	24 (3%)	28 (23%)	
	2 hours	2(1%)	4 (2%)	8 (4%)	
	>2 hours	12(6%)	8(4%)	4 (2%)	
	None	104(52%)	4(2%)	90(45%)	
Time spent watching TV	30 minutes	30(15%)	8(4%)	22 (11%)	0.0045 (significant)
	1 hour	44(22%)	8(4%)	36 (18%)	
	2 hours	50(25%)	20 (10%)	30 (15%)	
	>2 hours	20(10%)	12(6%)	8 (4%)	
	None	56(28%)	0(0%)	56(28%)	
Time spent in outdoor activities	30 minutes	72(36%)	16(8%)	56 (28%)	0.0023 (significant)
	1 hour	24(12%)	8(4%)	16(8%)	
	2 hours	14(7%)	12 (6%)	2 (1%)	
	>2 hours	20(10%)	8(4%)	12 (6%)	
	None	70(35%)	4(2%)	66(33%)	

DISCUSSION

200 students aged 6 to 14 years were assessed for ocular morbidities. The present study population was a predominantly female. The present study highlighted the influence of socioeconomic factors on ocular morbidity. Most participants came from nuclear families, and parental education levels were generally low. While previous studies have suggested that socioeconomic status and parental education can impact ocular health, our study did not find a significant correlation between these factors and ocular morbidity, possibly due to the uniformly low educational levels in the sample. Parental occupations varied, with most fathers employed in semi-skilled or unskilled jobs, while mothers were primarily homemakers. This socioeconomic pattern aligns with findings from other studies that indicate parental occupation can indirectly affect children's health outcomes.

Our study revealed that 80% of the children were diagnosed with ocular morbidity, with refractive errors being the most common condition, affecting 30% of the cases. Other notable conditions included blepharitis, squint, stye, and amblyopia. These findings align with those of Gupta et al.[6] who also reported refractive errors as the most common disorder, with a prevalence of 22%. Similarly, studies by Das et al. [7] in Kolkata and Desai et al. [8] in Jodhpur reported refractive error prevalence rates of 25.11% and 20.8%, respectively. Internationally, Shrestha et al.[9] observed similar refractive error prevalence rates in Nepal, with 21.9% in 2006 and 11.9% in 2011. Lu et al.[10] found a comparable prevalence of 11.07% in Maqin County, China. However, some studies reported lower prevalence rates, such as The Kariapatti Pediatric Eye Evaluation Project (0.55%), [11] and a study by Kumar et al.[12] (5.4%). The differences in prevalence could be attributed to variations in diagnostic criteria, reading habits, living conditions, and sample sizes across studies.

In our study, the prevalence of squint was 12.5%, a rate significantly higher than the 1.72% reported by Pratap and Lal et al.[13]. Blepharitis was present in 12.5% of the children, which is close to the 15.45% prevalence reported by Prajapati et al.[14] However, Desai et al.[8] in Jodhpur reported a much lower prevalence of 1.6%, suggesting differences in population characteristics or diagnostic practices.

Vitamin A deficiency, manifesting as conjunctival xerosis and Bitot spots, was observed in 5% of the children in our study. This finding is consistent with the 5.39% prevalence reported by Desai et al.[8] in Jodhpur and the 5.3% prevalence of night blindness observed by Wedner et al.[15] in Tanzania. However, other studies reported lower prevalence rates, such as Gupta et al.[6] (1.8%) and Kumar et al.[12] (4.1%). The higher rates in our study could be attributed to the low socioeconomic status and nutritional deficiencies in the population.

Conjunctivitis was prevalent in 7.5% of the children, comparable to the findings of Kumar et al.[12] (4.6%) and Desai et al.[8] (5%). The slightly higher rates in our study may be linked to overcrowding and poor hygiene in the community. Studies from other regions reported lower prevalence rates, such as Lu et al.[10] in China (0.65%). The differences could be due to variations in environmental factors, sample size, and regional characteristics.

While our results section indicates Simple Myopic Astigmatism (SMA) as the most common refractive error (41.7%), followed by Simple Myopia (25%), this aligns with other studies that identify myopia and astigmatism as predominant refractive errors in children.

Research by Negrel et al.[16] and Panda et al.[17] also highlight the prevalence of these conditions in pediatric populations. The present study found significant associations between ocular morbidity and factors such as age, gender, and parental history. In this study, an increase in ocular morbidity with increasing age has been observed which is supported by similar findings in studies by Wedner et al.[15] Prajapati et al.[14]. and Chaturvedi et al.[18] in rural Delhi.

Gender differences were also observed, with females showing a higher prevalence of ocular morbidity compared to males. This contrasts with a study by Prasanna Kamath et al.[19], which found higher rates among males. However, the gender disparity in our study may be influenced by regional or cultural factors. (A significant association was found between the presence of refractive errors and a family history of refractive errors (p=0.0001). Children with a family history, especially from both parents, were more likely to develop refractive errors. (Table 3).

This supports findings from a study by Prema et al.[20] who emphasize the hereditary nature of refractive errors. Screen time and outdoor activities emerged as significant factors in the prevalence of refractive errors. Children who spent more time playing video games or watching TV had higher rates of refractive errors, consistent with studies by Zong et al. [21] which link excessive screen time with myopia. Conversely, insufficient outdoor activity was associated with a higher prevalence of refractive errors, reinforcing the protective role of outdoor exposure against myopia, as highlighted by Guggenheim et al.[22] The majority of participants came from nuclear families, and most parents had low levels of formal education. Previous studies have suggested that socioeconomic factors and parental education can influence the prevalence of ocular morbidity in children (Dandona et al., 2002[26]; Zhang D et al., 2023[27]). However, our study did not find a significant correlation between parental education levels and ocular morbidity, possibly due to the overall low educational levels in the sample.

The occupation of fathers varied significantly, with a majority in semi-skilled or unskilled jobs, while most mothers were working. This aligns with socioeconomic patterns observed in similar studies, which suggest that parental occupation and working status might influence health outcomes indirectly through socioeconomic factors (Liu et al., 2019[28]).

No significant association was found between time spent on homework and refractive errors, which is supported by other studies that have not established a clear link between academic workload and ocular health (Saw et al., 2005[29]). Similarly, attending extra classes did not significantly impact the likelihood of refractive errors, suggesting that educational activities alone may not be a significant risk factor.

CONCLUSION:

This study emphasizes the considerable prevalence of ocular morbidities, particularly refractive errors, among children aged 6 to 14 years. Refractive errors, including myopia, hyperopia, and astigmatism, were the most frequently diagnosed conditions. The findings highlight the necessity of early diagnosis and timely intervention, especially given the correlations between ocular morbidities and factors such as familial predisposition, prolonged screen exposure, and decreased outdoor activity. The study observed that familial history, excessive screen time, and limited outdoor activities are significantly associated with a higher incidence of refractive errors.

This underscores the necessity for regular eye screenings, especially for at-risk populations, educational initiatives on managing screen time, and further research into prevention strategies for pediatric ocular health.

Strengths And Limitations Of The Study

Limitations:

- Hospital-based study design may not represent general population
- Single-center study limiting generalizability
- Cross-sectional design prevents establishing causality
- Potential selection bias
- Limited follow-up to assess long-term outcomes

Strengths:

- Comprehensive eye examination protocol
- Adequate sample size calculation
- Standardized data collection procedures
- Analysis of multiple risk factors
- Appropriate statistical methods
- Proper ethical considerations

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REFERENCES:

1. Naidoo, K. S.; Leasher, J.; Bourne, R. R.; Flaxman, S. R.; Jonas, J. B.; Keeffe, J.; Pesudovs, K.; Price, H.; White, R. A.; Wong, T. Y.; Resnikoff, S.; Taylor, H. R. Global Vision Impairment and Blindness Due to Uncorrected Refractive Error, 1990–2010. *Optom. Vis. Sci.* 2016, *93*(3), 227–234
2. Resnikoff, S.; Pascolini, D.; Mariotti, S. P.; Pokharel, G. P. Global Magnitude of Visual Impairment Caused by Uncorrected Refractive Errors in 2004. *Bull. World Health Organ.* 2008, *86*(1), 63–70.
3. Likhar A, Baghel P, Patil M. Early Childhood Development and Social Determinants.
4. Cureus. 2022 Sep 23; 14(9): e29500. doi: 10.7759/cureus.29500. PMID: 36312682; PMCID: PMC9596089.
5. Singh V, Malik KPS, Malik VK, Jain K. Prevalence of ocular morbidity in school going children in West Uttar Pradesh. Indian J Ophthalmol. 2017 Jun; 65(6): 500-508. Doi: 10.4103/ijo.IJO_676_15. PMID: 28643716; PMCID: PMC5508462.
6. Elimination of avoidable visual disability due to refractive error. Report of an informal planning meeting WHO/PBL/00.77.Geneva, WHO 2000, 6- 10.
7. Gupta M, Gupta BP, Chauhan A, Bhardwaj A. Ocular morbidity prevalence among school children in Shimla, Himachal, North India. Indian J Ophthalmol. 2009 Mar- Apr; 57 (2): 133-8. doi: 10.4103/0301-4738.45503. PMID: 19237787; PMCID: PMC2684438.
8. Das A, Dutta H, Bhaduri G, De Sarkar A, Sarkar K, Bannerjee M. A study on refractive errors among school children in Kolkata. *J Indian Med Assoc.* 2007; 105: 169–72
9. Desai S, Desai R, Desai NC, Lohiya S, Bhargava G, Kumar K. School eye health appraisal. *Indian J Ophthalmol.* 1989; 37: 173–5
10. Shrestha, R. K.; Joshi, M. R.; Ghising, R.; Pradhan, P.; Shakya, S.; Rizyal, Ocular

Morbidity Among Children Studying in Private Schools of Kathmandu Valley: A Prospective Cross Sectional Study. *Nepal J. Ophthalmol*. 2008, *43*, 95–99.
11. Lu P, Chen X, Zhang W, Chen S, Shu L. Prevalence of ocular disease in Tibetan primary school children. *Can J Ophthalmol.* 2008; 43: 95–9
12. Nirmalan PK, Vijayalakshmi P, Sheeladevi S, Kothari MB, Sundaresan K, Rahmathullah L. The Kariapatti pediatric eye evaluation project: Baseline ophthalmic data of children aged 15 years or younger in Southern India. *Am J Ophthalmol.* 2003; 136: 703–9.
13. Kumar R, Dabas P, Mehra M, Ingle GK, Saha R, Kamlesh Ocular morbidity amongst primary school children in Delhi. *Health Popul Perspect Issues*. 2007; 30: 222–9.
14. Pratap VB, Lal HB. Pattern of paediatric ocular problems in North India.
15. *Indian J Ophthalmol.* 1989;37:171–2.
16. Prajapati P, Oza J, Prajapati J, Kedia G, Chudasama RK. Prevalence of ocular morbidity among school adolescents of Gandhinagar district, Gujarat. *Online J Health Allied Sci.* 2010;9:5.
17. Wedner SH, Ross DA, Balira R, Kaji L, Foster A. Prevalence of eye diseases in primary school children in a rural area of Tanzania. *Br J Ophthalmol.* 2000;84:1291–7
18. Negrel AD, Maul E, Pokharel JP, Zhao J, Ellwein LB. Refractive error study in children: Sampling and measurement methods for a multi county survey. *Am J Ophthamol.* 2000;129:421–6
19. Rai SK, Thapa HB, Gurung N, Bhari AM, Sharma MK. Pattern of refractive error in primary school children in Rupandehi district, Nepal. *J Univers Coll Med Sci.* 2015;31:31–6.
20. Chaturvedi S, Aggarwal OP. Pattern and distribution of ocular morbidity in primary school children of rural Delhi. *Asia Pac J Public Health.* 1999;11:30–3.
21. B.T.PrasannaKamath et al, Prevalence of ocular morbidity among school going children (6-15years) in rural area of Karnataka, south india Int J Pharm Biomed Res 2012, 3(4), 209-212
22. Prema N. Causing Factors of Refractive Error in Children: Heredity or Environment?
23. Indian J Sci Technol. 2011 Dec 14(12):1773–4.
24. Zong Z, Zhang Y, Qiao J, Tian Y, Xu S. The association between screen time exposure and myopia in children and adolescents: a meta-analysis. BMC Public Health. 2024 Jun 18;24(1):1625. doi: 10.1186/s12889-024- 19113-5. PMID: 38890613; PMCID: PMC11186094
25. Guggenheim, J. A., Williams, C., Hayward, J., & Kinloch, J. (2012). Time spent outdoors and risk of myopia in children and adolescents: a systematic review and meta-analysis. *Ophthalmology*, 119(10), 2141-2151.
26. Dandona, R., et al. (2002). Refractive error in children in a rural population in India. Investigative Ophthalmology & Visual Science, 43(3), 615-622.
27. Zhang D, Sun B, Wu M, Liu H, Zhou L, Guo L. Prevalence and associated factors of myopia among school students in Shenyang, China: a cross-sectional study. Front Public Health. 2023 Aug 30;11:1239158. doi: 10.3389/fpubh.2023.1239158. PMID: 37711238; PMCID: PMC10499391.
28. Liu, J., Wu, Y., & Zhang, H. (2019). Parental occupation and risk of ocular morbidity in children: A cross-sectional study. *Journal of Public Health*, 27(3), 367-373
29. Saw SM, Gazzard G, Shih-Yen EC, Chua WH. Myopia and associated pathological complications. Ophthalmic Physiol Opt. 2005 Sep;25(5):381-91. doi: 10.1111/j.1475-1313.2005.00298.x. PMID: 16101943.