Cover Page

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A PREVENTIVE APPROACH AND DETECTION OF HUMAN EYE VISION PROBLEMS AMONGST CHILDREN: ANALYSIS

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Abstract

Early examination and diagnosis of eye diseases and related problems in children are vital in preventing visual impairment, which can adversely affect academic performance, social interaction, and overall quality of life. This paper underscores the importance of early detection of common eye conditions such as refractive errors, squinting, amblyopia, and allergic eye conditions. The role of eye care specialists in screening methods—including ocular health assessments and visual acuity tests during early childhood—is highlighted to prevent severe vision loss. Timely treatment can halt the progression of diseases before they become irreversible. Screening is particularly crucial for children aged 4 to 7 years, as early diagnosis and intervention can stop the advancement of vision problems. Ophthalmologists, optometrists, and opticians play a crucial role in detecting and correcting abnormalities in children's vision.

Keywords: Child Eye Care, Screening, Visual Impairment, Ophthalmologist, and Awareness.

Introduction

Vision and eye development during early childhood significantly influence overall child growth, confidence, learning capabilities, and social and emotional wellbeing. If untreated, conditions such as refractive errors, squint, and amblyopia can severely impact daily activities, including learning, academic outcomes, and self-esteem. This paper emphasizes the importance of early detection using modern screening and diagnostic techniques and highlights challenges in delivering eye care to underserved populations. India has the highest number of blind children in the world.

Children often do not report visual difficulties, making routine eye screenings essential. Information on eye problems is gathered from parents, focusing on children's habits such as screen time and symptoms like eye watering and irritation. Additionally, teachers provide insights regarding children's vision-related struggles in the classroom, such as difficulties reading or writing.

Screening for vision issues among children aged 4 to 7 was conducted in three schools in Aurangabad, Maharashtra. Children who failed the screenings were referred to healthcare facilities for further evaluation.

Programs such as the Rashtriya Bal Swasthya Karyakram (RBSK) and the National Programme for Control of Blindness and Visual Impairment (NPCB&VI), run by the Ministry of Health and Family Welfare, play significant roles in early detection, treatment, and awareness of childhood eye problems across India.

Preventive Eye Care Process in Children

Preventive eye care involves a systematic approach starting from early detection through screening, accurate diagnosis by specialists, prompt treatment, and regular follow-up to ensure vision problems do not worsen. The flowchart below outlines this process:

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Literature Review

Sr. No	Title	Literature Type	Source	Author(s)	Publication Year	Key Insights
1	Insights into Parental Perspectives: Children's Eye Care in Saudi Arabia	Article	International	Sokinah N. Al Musalami et al.	2025	Emphasizes parental responsibility for children's eye care and necessity of routine eye check-ups.
2	Challenges of Eye Health Care in Children and Strategies to Improve Treatment Uptake in the UK	Article	International	Viola Cassetti et al.	2019	Describes school screening follow-ups and parental involvement in England's eye care system.
3	Status of Child Eye Health in India	Article	National	Dr. Anuradha Narayan et al.	2020	Identifies childhood blindness control as a national priority aligned with WHO Vision 2020 goals.
4	Parental Knowledge and Attitude to Children's Eye Care Services	Article	International	Onyeka Amiebenomo	2016	Highlights the critical role of parental knowledge in ensuring early eye care.
5	Eye Care in Young Children: A Parents' Perspective of Access and Barriers	Article	International	Ali Alsaqr	2023	Reports on a Saudi Arabian survey about barriers to accessing eye care for children.

Hypotheses

- **Hypothesis 1:** Early identification of vision problems in children aged 4-7 leads to improved academic performance compared to later diagnosis.
- **Hypothesis 2:** Increased public awareness about early eye screenings correlates with higher rates of vision problem detection and treatment.

Research Methodology

The study adopts a descriptive cross-sectional design targeting children aged 4-7 years enrolled in three pre-primary schools in Aurangabad, Maharashtra. This design allows assessment of vision issues prevalence and evaluation of early detection's impact.

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Qualitative data were collected from parents, pediatricians, and eye care specialists and analyzed thematically to uncover common barriers and insights related to early vision problem detection.

Scope and Limitations

- **Scope:** The study explores prevalent vision issues such as refractive errors, strabismus, and eye strain among young children.
- **Limitations:** Parental knowledge and perception biases might affect the accuracy of reported vision problems.

Research Gap

While the role of healthcare professionals in pediatric eye care is well studied, research on parental awareness and its influence on timely screening remains limited. Understanding parental knowledge, attitudes, and behaviors can improve early diagnosis and treatment outcomes. Additionally, the long-term effectiveness of early treatments for conditions like amblyopia and strabismus needs further exploration.

Objectives

1. **Identify Common Vision Problems:** To explore prevalent vision issues in children like refractive errors, amblyopia, and strabismus and their effects on development.
2. **Highlight Early Screening Importance:** To stress early vision screenings for timely detection and prevention of long-term impairment.
3. **Promote Public Awareness:** To raise awareness among parents, caregivers, and educators about early vision screening's significance and consequences of undiagnosed vision problems.

Prevalence of Eye Problems in Children Aged 4-7

During the screenings conducted, several common eye problems were identified with varying prevalence rates as shown below.

According to the data, refractive errors were the most common issue, affecting 20% of children screened, followed by red eyes (10%) and squint (8%). Symptoms such as eye rubbing and tearing/discharge were also noted, indicating possible allergies or infections. These findings underscore the importance of routine eye check-ups and interventions to correct these conditions at an early stage, thereby preventing long-term visual impairment and related developmental difficulties.

Purpose of the Study

This study aims to demonstrate the critical importance of early detection of vision problems among children aged 4 to 7, a vital period for eye development. It seeks to inform parents, teachers, doctors, and caregivers about the necessity of regular eye check-ups, the risks associated with delayed diagnosis, and to report the prevalence and types of vision problems experienced by children in this age group.

Data Collection and Analysis

The study surveyed 50 children aged 4-7 years in Aurangabad. A structured questionnaire assessed daily routines, screen time, and eye-related symptoms, based on parental responses. The screening team included two optometrists, two ophthalmologists, and two school faculty members. Among the children screened, 20% exhibited refractive errors, 8% had squint, 10% showed red eyes, 7% reported eye rubbing, and 5% experienced tearing and discharge.

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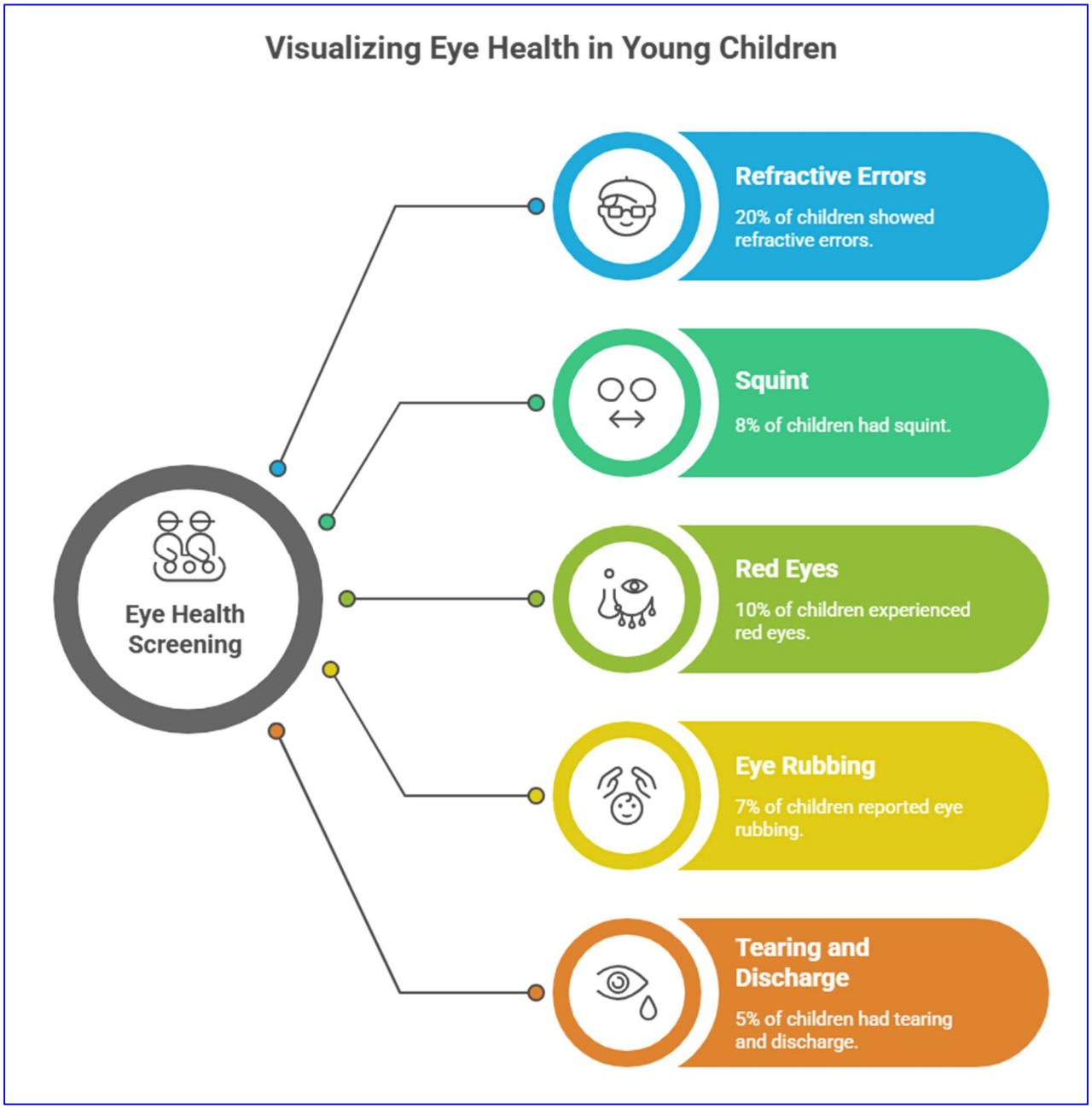

Figure : Analysis of visualizing the eye health in young children : Source : Author created

Discussion

Early childhood is a critical period for eye development, during which untreated vision problems can lead to permanent impairment. Interventions such as corrective glasses, vision therapy, and surgical options for conditions like strabismus can offer substantial benefits if applied timely. Incorporating eye health education into parent-teacher interactions and school health programs helps bridge the gap in awareness.

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Eye health impacts a child's cognitive and social development significantly. Children with undiagnosed vision issues often lag behind peers in reading and classroom participation, affecting self-esteem. Thus, collaboration between ophthalmologists, educators, and parents is essential for successful early intervention.

Conclusion

The findings confirm that early vision screening, especially between ages 4 and 7, significantly contributes to improved academic performance. Children with undiagnosed vision issues often struggle with reading, writing, and concentration, but timely detection and correction (e.g., prescription glasses) enhance learning outcomes. Awareness programs and initiatives providing free eye exams and corrective services facilitate better academic success. Educating parents, teachers, and caregivers about children's eye health promotes proactive eye care and ultimately strengthens children's overall confidence and quality of life.

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