

Knowledge and Awareness of the Public toward Pediatric Eye Health and Diseases in Aseer region, Saudi Arabia: A Cross-Sectional Population Study

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Abstract

Pediatric ophthalmic conditions are a common and a serious public health problem, as they can not only impact the child's ability to learn, have a normal social life, and get a better quality of life, but they can also lead to complete blindness or visual impairment. Early intervention is necessary for childhood eye diseases since they can result in ongoing issues. The underlying causes of blindness in children differ significantly from region to region, depending on some factors, including socioeconomic development and access to primary healthcare services and facilities. However, it is estimated that there are over 19 million people globally with visual impairments and that there are roughly 1.4 million cases of blindness. As a result, the purpose of this study is to assess the parents' and caregivers' awareness in Aseer, Saudi Arabia, about various common pediatric ophthalmic diseases, including strabismus, amblyopia, refractive errors, and congenital glaucoma. By identifying the gap in knowledge and awareness, this could help create targeted educational and awareness programs geared toward the parents and the public of Aseer, Saudi Arabia,

which could help prevent or reduce the prevalence of pediatric ophthalmic conditions, and boost the children's eye health.

Key words: knowledge, awareness, paediatric eye health, eye diseases, Aseer, Saudi Arabia

Introduction

Impact on a child's growth, education, future employment opportunities, and quality of life are only a few of the many reasons why pediatric ophthalmic problems are crucial. Eye disorders in children can occur as a result of prenatal, neonatal, and childhood etiologies. Orbit, eyelid, whole globe, conjunctiva, cornea, sclera, lens, vitreous, retina, uvea, optic nerve, and refractive system are all possible locations for an eye lesion (Sethi, 2008).

Pediatric eye conditions rank high among the reasons for medical consultation, so it's important for every child having an eye disease to seek immediate intervention since eye diseases are common and may represent a serious public health issue among children globally to the extent that about 500,000 children go blind every year around the world; of them, half die within the first two years (Nwosu, 1999). About 1.5 million children are blind worldwide, with more than a million of those living in Asia (Bikebele and Olusanya, 2006). The most frequent ocular abnormalities encountered in American school-aged children are strabismus, amblyopia, and optical problems, which affect their visual acuity (Castenes, 2003).

Africa also showed a high prevalence of eye diseases among children. For example, ocular injuries (13.5%), vernal conjunctivitis (25.3%), corneal inflammation (12.5%), and refractive error (25.7%) were the major causes of ocular morbidity in Nigerian children (Isawummi, 2003). However, strabismus (36.1%), refractive error (26.5%), ocular trauma (7.5%), and conjunctivitis (7.3%) were the most common childhood eye illnesses in Jizan, Saudi Arabia (Darraj et al, 2016). Since the prevalence of pediatric ophthalmic diseases might vary from one region to another, the most common causes of eye morbidity in children in a private hospital in Dammam, KSA, were refractive errors (REs; 44.4%), strabismus (38%) and amblyopia (9.1%) (Al-Tamimi et al., 2015).

The incapacity to express distress and the risk of amblyopia in the event of visual impairment make ocular morbidities in children particularly challenging (Bodunde and Onabolu, 2004). Vision disorders and eye morbidities are preventable and can have a negative impact on a child's learning, personality, and social development at school, so it's important that they get the care they need immediately after they get an eye disease (Pratab and Lai, 1989). Therefore, the three levels of intervention, including primary, secondary, and tertiary prevention, should be utilized to manage pediatric ophthalmic disorders (Salman, 2016).

The Aim of the Study

The study aims to investigate the awareness of pediatric eye diseases and conditions, including strabismus, amblyopia, refractive errors, and congenital glaucoma, among the public in the Aseer region of Saudi Arabia. Since there are not sufficient studies performed in Aseer, Saudi Arabia,

the proposal aims to assess the level of knowledge and understanding of these eye conditions among the general population, specifically focusing on parents or caregivers of children. By conducting this research, the aim is to identify gaps in awareness and knowledge, as well as potential misconceptions, regarding these eye conditions. The findings of the study will help inform the development of targeted educational and awareness campaigns to improve early detection, timely intervention, and overall eye health outcomes in children in Aseer, Saudi Arabia.

Objectives

The main objectives of this research proposal are:

- To determine the level of awareness among parents and caregivers regarding pediatric eye diseases and conditions, including strabismus, amblyopia, refractive errors, and congenital glaucoma, in Aseer, Saudi Arabia.
- To identify the sources of information that parents and caregivers in Aseer, Saudi Arabia, rely on for their knowledge of pediatric eye diseases and conditions, including strabismus, amblyopia, refractive errors, and congenital glaucoma.
- To assess the understanding of the signs, symptoms, risk factors, and severe complications associated with strabismus, amblyopia, refractive errors, and congenital glaucoma among the public, parents, and caregivers in Aseer, Saudi Arabia.
- To explore the perception of the importance of early detection and treatment of pediatric eye diseases and conditions among parents and caregivers.
- To investigate any associations between demographic factors (e.g., age, education, socioeconomic status) and the level of awareness among the public in Aseer, Saudi Arabia.

Research Questions

- To what extent are pediatric ophthalmic conditions, including strabismus, amblyopia, refractive errors, and congenital glaucoma, prevalent in Aseer, Saudi Arabia?
- What is the level of knowledge of parents and caregivers about pediatric ophthalmic conditions, including strabismus, amblyopia, refractive errors, and glaucoma in Aseer, Saudi Arabia?
- What are the risk factors for pediatric ophthalmic conditions, including strabismus, amblyopia, refractive errors, and congenital glaucoma, in Aseer, Saudi Arabia?
- What are the sources of information that parents and caregivers in Aseer, Saudi Arabia, rely on to learn about eye diseases and conditions in children?
- What are the attitudes and beliefs of parents and caregivers in Aseer, Saudi Arabia, towards seeking professional help and treatment for eye diseases and conditions in children?

Literature Review

The prevalence of eye diseases and conditions among children is a significant public health concern globally; early detection and intervention are crucial in preventing long-term visual impairment and promoting optimal eye health in children. However, to effectively address these issues, it is essential to understand the level of awareness among parents and caregivers regarding pediatric eye diseases and conditions, including strabismus, amblyopia, refractive errors, and congenital glaucoma. This literature review aims to examine the existing body of knowledge on the awareness of these eye diseases and conditions, the prevalence of these eye conditions, their impact on children's visual health, and the importance of early detection and treatment among the general public in Aseer region, Saudi Arabia.

The review will provide a comprehensive overview of the current literature available on the awareness of eye diseases and conditions among parents and caregivers. By synthesizing the existing evidence, this review identifies gaps, patterns, and trends in awareness levels, as well as the factors influencing knowledge and understanding of these eye conditions in the target population.

Dale et al. (2018) defined strabismus as a manifest deviation of the eyes that exceeds the control of the fusional mechanism so that the eyes are misaligned under binocular conditions.

Williams et al. (2008) stated that the frequency of strabismus in children is estimated to be between 0.8% and 5.65%. Bez et al. (2009) also investigated the challenges associated with the diseases, including diminished binocularity and amblyopia, as well as the long-term psychological and social consequences, including low self-esteem, depression, troubled relationships, and difficulty holding down a job.

Cotter et al. (2011) reported that strabismic amblyopia is one of the most common and frequent eye disorders in childhood. Patients with strabismus often complain of difficulties with binocular vision and depth perception, as well as with their appearance, their ability to learn, their relationships with others, their solitude, and their fear of surgery.

Although the main etiology of strabismus remains poorly established, Zhu et al. (2015) noted that there are some factors that could increase the chances of getting the disease, including ocular factors like hyperopia, myopia, astigmatism, anisometropia, and amblyopia; family history of strabismus and amblyopia; maternal factors like smoking or alcohol use during pregnancy; and perinatal factors like intrauterine growth retardation, prematurity, and low birth weight. They also addressed the fact that hyperopia and esotropia are highly associated with ocular risk factors. Donnelly (2012) also reported some risk factors, including family history, race or ethnicity, genetics, smoking, premature birth, low birth weight, refractive error, and neurological impairment.

According to Sharimawat (2015), if strabismus is diagnosed and treated early on, it can have positive effects on patients' visual and socioeconomic well-being. Refractive correction and vision therapy, when performed on children at a younger age, are the most effective non-invasive management alternatives that restore vision and eye deviation. Amblyopia, the leading cause of visual impairment or blindness due to laziness of the eye, can be prevented or at least mitigated by early detection and treatment of strabismus in children.

Barrett et al. (2004) defined amblyopia as a reduced visual acuity or visual impairment that occurs at a young age due to conditions like strabismus and anisometropia, even in the absence of obvious injury to the eye or visual system or ocular pathology. Al-Yahya et al. (2012) addressed the fact that amblyopia is one of the most widespread health issues, affecting an estimated 5% of the population. Robaei et al. (2006) stated that amblyopia is the leading cause of blindness in both children and adults with unilateral visual impairment. Webber and Wood (2005) revealed that although amblyopia most often affects just one eye, it can affect both eyes. Tailor et al. (2016) identified deprivation, anisometropia, and strabismus as the most common causes of amblyopia in one eye.

Several studies were conducted to assess amblyopia's prevalence in Saudi Arabia. Fatani (1994) reported that it's about 2.6% in the capital city of Riyadh, while Aldehbi (2015) found that it's 3.9% in the province of Qassim. Another study by Bardisi and Binsadiq (2002) reported that it's 1.3% in the city of Jeddah, and Abolfotouh et al. (1994) assumed that it's 1.9% in the city of Abha. So, the characteristics of the analyzed patients, the criteria and cutoff points of visual measures used to characterize amblyopia may account for these discrepancies in prevalence.

De Zarate and Tejedore (2007) reported that the treatment for amblyopia is most effective before the age of 8, so it can occur at any time between 4 months and 8 years. They also stated that high, untreated refractive errors are one of the leading causes of binocular amblyopia. In addition to a decrease in visual acuity, other visual impairments such as poor accommodation, binocular dysfunction, abnormal contour interactions, positional uncertainty, reduced contrast sensitivity, spatial distortions, abnormal eye movements, suppression, and fixation instability can contribute to amblyopia.

Alzahranti et al. (2018) supported the role of patching in the treatment of amblyopia, addressing the fact that patching, from 1 hour to complete occlusion, is used to treat amblyopia. A Pediatric Eye Disease Investigator Group (2002) performed a randomized controlled study to compare the effectiveness of atropine and patching in the treatment of amblyopia, and they reported that when it comes to the initial therapy of moderate amblyopia in children aged 3 to less than 7 years old, both atropine and patching are appropriate modalities because they elicit improvement of similar magnitude.

According to Bourne et al. (2013), myopia, hyperopia, and astigmatism are examples of refractive errors (RE), which are abnormalities in the optical structure of the eye. They continue to be one of the leading contributors to vision impairment in school-aged children and one of the most prevalent ocular diseases worldwide.

Rose et al. (2002) suggested that over the past few decades, there has been a sharp rise in the prevalence of RE worldwide, especially myopia, which indicates that RE in people is sensitive to environmental influences in a variety of physical environments, groups, and lifestyles. In addition, Saw (2003) reported that higher levels of education were linked to a higher prevalence of myopia. According to Ma (2010), the prevalence of RE in Saudi Arabia ranged from 4.5% to 34.9%, depending on the age of the children.

Guo et al. (2015) stated that the primary cause of RE may be influenced by a number of variables. Some potential risk factors are usually linked to myopia development, including educational level, lifestyle characteristics related to schools, and near-work activity in general. A recent study by Huang et al. (2015) linked near-work activity to myopia, reporting that children between the ages of 6 and 18 who engaged in more near-work activity had an increased prevalence of myopia. They added that it could hasten the progression of myopia.

Bejjani et al. (1998) stated that in the absence of other specific ocular or systemic diseases that can cause glaucoma, primary congenital glaucoma (PCG) is typically a severe form of glaucoma defined by elevated intraocular pressure from birth. PCG is thought to be up to ten times more common in Saudi Arabia than it is in the West. Kotb et al. (2006) reported that around 20% of childhood blindness in the Kingdom is attributed to PCG, making it a prominent cause of childhood blindness.

Since most pediatric ophthalmic diseases are preventable if they are diagnosed in the early stages, several studies were conducted to assess the level of awareness of parents and caregivers in Saudi Arabia about various pediatric ophthalmic conditions. Alsaqr and Masmali (2019) conducted a cross-sectional population study to assess the level of awareness among the Saudi Arabian community, and they reported that the Saudi population as a whole lacked knowledge of amblyopia. They also demonstrated that the children's eyesight can be damaged or impaired because of this lack of awareness. In addition, they suggested raising awareness among the general public through health care providers, schools, the media, and community groups. Another cross-sectional population study by Rashed et al. (2017) reported that only 51.5% of the population in Riyadh, Saudi Arabia, had appropriate knowledge about pediatric eye illnesses. Al Mazrou et al. (2020) also performed a cross-sectional study, and they reported that both parents have a reduced level of knowledge and awareness about the common pediatric eye conditions. They also supported the role

of educational and awareness programs for common pediatric ophthalmic disorders in improving children's eye health, assuming that such programs should target both parents and focus more on mothers.

Methodology

Study Design

Our study utilized a quantitative cross-sectional population study design to gather data on awareness levels of pediatric eye conditions, including strabismus, amblyopia, refractory errors, and congenital glaucoma in the Aseer region.

Sample Selection

A representative sample of 597 parents and caregivers with children aged 0–12 years was selected from various communities in the Aseer region of Saudi Arabia.

Inclusion Criteria:

- Parents or caregivers of children aged between 0 and 14 years.
- Residents of the Aseer region of Saudi Arabia.
- Individuals who can understand and respond to the survey/questionnaire in Arabic or English.
- Willingness to participate voluntarily in the study.

Exclusion Criteria:

- Individuals who are not parents or caregivers of children.
- Parents or caregivers who have children older than 14 years.
- Non-residents of the Aseer region.
- Unwillingness to participate or provide informed consent for the study.

These criteria were designed to ensure that the research focused specifically on the target population of parents or caregivers in the Aseer region, who are directly responsible for the health and well-being of children. By defining these criteria, the study gathered relevant data from individuals who meet the inclusion criteria while excluding those who did not fit the intended target population.

Sampling Technique

Non-probability Sampling Method, i.e., convenience sampling; we chose participants based upon availability and willingness to partake in our research.

Data Collection

A structured questionnaire was developed and administered to gather data according to our criteria, including awareness levels, sources of information, understanding of signs and symptoms, and perceptions regarding pediatric ophthalmic conditions (strabismus, amblyopia, refractory errors, and glaucoma). Participants who agreed to participate were given a full explanation of the purpose of this study, and after that they were asked to sign an informed consent form.

Data Analysis:

Descriptive statistics was used to summarize awareness levels, and knowledge of **eye infections**. Inferential statistics, such as chi-square tests. SPSS Statistical Package was used to analyze the data.

Ethical Considerations:

Ethical approval was sought from the relevant research ethics committee. Informed consent was obtained from the participants, ensuring the confidentiality and anonymity of their responses. The research adhered to the principles of ethical research conduct.

Results

First, we designed a descriptive well-structured online questionnaire, which was given to parents and caregivers in Aseer, Saudi Arabia so that we can assess the level of knowledge and the sources of information of parents and caregivers of the Aseer region of Saudi Arabia regarding some pediatric ophthalmic disorders including strabismus, amblyopia, congenital glaucoma, and refractory errors. Our study also aimed to assess the prevalence of these conditions among the children of Aseer, Saudi Arabia.

After analyzing the data, the results showed that up to 597 participants agreed to take our online questionnaire. Of the 597 responses, 344 participants were males (57.6%), and the other 253 respondents were females (42.4%).

The results also showed that out of 597 participants, 474 (79.4%) had children with no eye problems, while 123 (20.6%) had children with eye problems.

Table 1 shows that about 395 (66.2%) agreed that wearing glasses for children if they need them can help their vision develop normally, while 146 (24.5%) were not sure about this information. In addition, only 56 (9.4%) disagreed with the statement. Moreover, 186 (31.2%) agreed that it's normal for children between one and seven years to roll up their eyes sometimes, while approximately 187 (31.3%) disagreed with that. About 224 (37.5%) were not sure about that.

Table 1: Current General Knowledge of the participants regarding specific statements

Wearing glasses if you need them when you are less than 7 years old will make your eyes and vision develop normally?		
	Frequency	Percent
Agree	395	66.2%
Disagree	56	9.4%
Not sure	146	24.5%
Is it normal for a child between the ages of one and seven years to roll his eyes sometimes?		
	Frequency	Percent
Agree	186	31.2%
Disagree	187	31.3%
Not sure	224	37.5%

Table 2 shows the level of awareness among the participants regarding lazy eye (Amblyopia) and cataracts in children. It shows that about 27% of the participants don't know what lazy eye is, however up to 42.9% of them address that it's defined as a difficulty in seeing in one or both eyes. In addition, 41% of the participants don't know the definition of cataract. The table also shows that 2.3% of the respondents stated that cataracts don't affect children, and 35.5% don't know whether cataracts affect children or not.

Table 2 also addresses that 65.3% of the participants don't know whether cataracts may lead to permanent blindness in children or not.

Table 2: Awareness of the parents and caregivers about lazy eye and cataracts in children

What is the definition of lazy eye?		
	Frequency	Percent
Imbalance in both eyes	1	0.2%
Decreased night vision	22	3.7%
Deterioration of the optic nerve	92	15.4%
Difficulty seeing in one or both eyes	256	42.9%
Loss of parallelism between the eyes	65	10.9%
I don't know	161	27%
What is a cataract?		
	Frequency	Percent
White spot in the eye	94	15.7%
The lens changes as the lens become opaque	156	26.1%
A white membrane that grows over the eye	100	16.8%
I don't know	247	41.4%
Does cataract affect children?		
	Frequency	Percent
Yes	371	62.2%
No	14	2.3%
I don't know	212	35.5%
Can cataracts lead to permanent blindness in children?		
Yes	165	27.7%
No	42	7%
I don't know	390	65.3%

Table 3: Awareness of the parents and caregivers about strabismus and congenital glaucoma in children

What is glaucoma?		
	Frequency	Percent
Increased eye pressure	2	0.3%
High eye pressure that leads to damage to eye nerve	218	36.5%
Opacity of the lens of the eye	55	9.2%
An age-related process that leads to a decrease in peripheral vision	42	7%
I don't know	280	46.9%
Can glaucoma affect children?		
	Frequency	Percent
Yes	242	40.6%
No	30	5%
I don't know	325	54.4%
Can congenital glaucoma lead to blindness?		
	Frequency	Percent
Yes	213	35.7%
No	17	2.8%
I don't know	367	61.5%
What do you know about strabismus?		
	Frequency	Percent
Deviation of the eyes	1	0.2%
Deviation and abnormal movements of the eye	1	0.2%
A refractive defect that occurs due to the irregular shape of the eyeball	71	11.9%
Opacity in the lens of the eye	19	3.2%
An optical defect that puts the eyes in an imbalanced state so that each eye turns in a different direction	420	70.4%
I don't know	85	14.2%
Can strabismus be treated?		
	Frequency	Percent
Yes	412	69%
No	28	4.7%
I don't know	157	26.3%
According to your knowledge, what are the options for strabismus treatment?		
	Frequency	Percent
Glasses	99	16.6%
Glasses or contact lenses	1	0.2%
Eye glasses and surgery	1	0.2%
Cover the eye	21	3.5%
Eye surgery	156	26.1%
All of the above	194	32.5%
I don't know	125	20.9%
What are the risk factors for developing a squint?		
	Frequency	Percentage
Eye refractive errors	53	8.9%
Systemic diseases (Down's syndrome, cerebral palsy)	18	3%
Family history	85	14.2%
All of the above	203	34%
I don't know	238	39.9%
What do you know about the complications of untreated squint?		
	Frequency	Percent
Poor self-image	42	7%
Poor personal relationships and appearance	29	4.9%
Visual loss	67	11.2%
Cosmetic stigma	26	4.4%
All of the above	211	35.3%
I don't know	222	37.2%

Table 3 shows that almost 46.9% of the participants are not aware of the definition of glaucoma. Moreover, only 5% of the participants believe that glaucoma can affect children. 61% of the respondents don't know whether congenital glaucoma may lead to blindness or not.

Table 3 also reveals that 70.4% of the respondents define strabismus as an optical defect that puts the eyes in an imbalanced state so that each eye turns in a different direction. In addition, 69% of the participants believe that strabismus can be treated. However, only 32.5% of the participants address that strabismus can be treated by using glasses, contact lens, eye coverage, or even eye surgery. In addition, 39.9% of the respondents are not aware of the risk factors for developing strabismus. 35.3% also address that complications of untreated strabismus may include poor self-image, poor personal relationship and appearance, cosmetic stigma, and even visual loss.

Table 4 shows that 76,9% of the participants are not aware of refractory errors, and up to 60% of them don't know the symptoms of refractory errors. Moreover, 61.6% of the respondents don't know the risk factors for developing refractory errors. Only 29% of the participants note that deviation-astigmatism, farsightedness, and nearsightedness are types of refractory errors.

Table 4 also shows that up to 51.4 of the participants don't know whether refractory errors affect academic performance or not. In addition, about 68.2% of the participants have no idea if refractory errors may cause blindness. 60.3% also state that hospital is the appropriate place to request assistance in case they have refractory errors.

Table 4: Awareness of the parents and caregivers about refractory errors in children

Do you know what refractive errors are?		
	Frequency	Percent
No	459	76.9%
Yes	138	23.1%
What are the symptoms of refractive defects?		
	Frequency	Percent
Secretions	20	3.4%
Blurry vision	195	32.7%
Rubbing the eye	24	4%
I don't know	358	60%
What are the risk factors for developing refractive defects?		
	Frequency	Percent
Family history	113	18.9%
Eye infections	80	13.4%
Patient contact	20	3.4%
Malnutrition	16	2.7%
I don't know	368	61.6%
When do refractive defects occur?		
	Frequency	Percent
Eye infections	43	7.2%
When undemourished	26	4.4%
When light rays are not focused on the retina	163	27.3%
I don't know	365	61.1%
What are the types of refractive defects?		
	Frequency	Percent
Deviation-Astigmatism	35	5.9%
Farsightedness	19	3.2%
Nearsightedness	32	5.4%
All of the above	173	29%
I don't know	338	56.6%
What is the distance affected by refractive defects?		
	Frequency	Percent
Vision near and far	89	14.9%
Seeing from a different distance	73	12.2%
Only remote vision	48	8%
Just seeing up close	21	3.5%
I don't know	366	61.3%
What is the effect of refractive defects on academic performance?		
	Frequency	Percent
Decreased academic performance	203	34%
Increased academic performance	29	4.9%
No effect on academic performance	58	9.7%
I don't know	307	51.4%
Can refractive errors cause blindness?		
	Frequency	Percent
Yes	108	18.1%
No	82	13.7%
I don't know	407	68.2%
What is the appropriate place to request assistance due to refractive defects?		
	Frequency	Percent
Optical shop	20	3.4%
Health center	29	4.9%
Hospital	360	60.3%
I don't know	188	31.5%

Table 5 shows that about 50.9% of the participants get their information about eye diseases from medical staff, however, up to 25.6% get the information about eye diseases from friends and neighbors. Up to 43.2% use social media to get their information.

Table 5 also shows that up to 84.3% of the participants don't consider Television as a source of information of eye diseases, and up to 99% don't consider radio as a source of information.

Table 5: The source of information for the parents and caregivers about pediatric ophthalmic conditions

Do you consider medical staff as a source of your information about eye diseases?		
	Frequency	Percent
Yes	304	50.9%
No	293	49.1%
Do you consider friends and neighbors as a source of your information about eye diseases?		
	Frequency	Percent
Yes	153	25.6%
no	444	74.4%
Do you consider social media as a source of your information about eye diseases?		
	Frequency	Percent
Yes	258	43.2%
No	339	56.8%
Do you consider Television as a source of your information about eye diseases?		
	Frequency	Percent
Yes	94	15.7%
No	503	84.3%
Do you consider radio as a source of your information about eye diseases?		
	Frequency	Percent
Yes	6	1%
No	591	99%
Do you consider internet browser as a source of your information about eye diseases?		
	Frequency	Percent
Yes	264	44.2%
No	333	55.8%

Discussion

The goal of our study was to assess the prevalence of pediatric ophthalmic conditions, including strabismus, amblyopia, refractory errors, and congenital glaucoma, among the public in Aseer, Saudi Arabia. We used a well-structured online survey to assess the level of knowledge of parents and caregivers regarding these pediatric eye conditions and to evaluate the sources of information that parents rely on.

Our findings showed that out of 597 participants, 474 (79.4%) had children with no eye problems, while 123 (20.6%) had children with eye problems, which indicated that the prevalence of pediatric ophthalmic conditions is relatively low among the participants from the Aseer region of Saudi Arabia. Our results are in conflict with the findings by Darraj et al. (2016), who found that the frequency of pediatric ophthalmic conditions was high among the population in Jizan, Saudi Arabia. This conflict may be due to the demographic variations of pediatric ophthalmic conditions prevalence from region to region or to the lack of knowledge of the parents or caregivers about such eye conditions, which could let them believe that their children don't have an eye problem.

According to Dale et al. (2018), strabismus is defined as a manifest deviation of the eyes that exceeds the control of the fusional mechanism so that the eyes are misaligned under binocular conditions. Our study also investigated the parents' knowledge of whether it's normal for the child to roll their eyes sometimes. Up to 37.5% of the participants were not sure whether it was normal or not, which indicated their lack of knowledge about pediatric strabismus. Our study also revealed that 69% of the participants believe that strabismus can be treated, which converges with the findings by Sharimawat (2015), addressing the fact that if strabismus is diagnosed and treated early on, it can have positive effects on patients' visual and socioeconomic well-being. Our study stated that only 32.5% of the participants addressed the fact that strabismus can be treated by using glasses, contact lenses, eye coverage, or even eye surgery. In addition, 39.9% of the respondents are not aware of the risk factors for developing strabismus. So, most participants know that strabismus can be treated, but they are not aware of the treatment options or the risk factors for developing such a condition.

According to Barrett et al. (2004), amblyopia, or eye laziness, is a reduced visual acuity or visual impairment that occurs at a young age due to conditions like strabismus and anisometropia, even in the absence of obvious injury to the eye, visual system, or ocular pathology. Our study noted that only 42.9% of the participants were knowledgeable about amblyopia's definition, which converges with the findings of Alsaqr and Masmali (2019), who conducted a cross-sectional population study to assess the level of awareness among the Saudi Arabian community, and they reported that the Saudi population as a whole lacked knowledge of amblyopia.

According to Bejjani et al. (1998), primary congenital glaucoma (PCG) is typically a severe form of glaucoma defined by elevated intraocular pressure from birth. PCG is thought to be up to ten times more common in Saudi Arabia than it is in the West. Although Alsaqr and Masmali (2019) addressed the fact that PCG is the primary cause of childhood blindness in the Kingdom of Saudi Arabia, our findings revealed the parents' lack of knowledge about congenital glaucoma in children, so 46.9% of the participants are not aware of the definition of glaucoma, and up to 61% of the respondents don't know whether congenital glaucoma may lead to blindness or not.

Our study also assessed the general knowledge of parents in Aseer, Saudi Arabia, about refractory errors, and we found that 76.9% of the participants were not aware of refractory errors, and up to 60% of them didn't know the symptoms of refractory errors. Moreover, 61.6% of the respondents didn't know the risk factors for developing refractory errors. Only 29% of the participants noted that deviation-astigmatism, farsightedness, and nearsightedness are types of refractory errors.

In addition, about 68.2% of the participants have no idea if refractory errors may cause blindness. So, our study also indicated that participants' lack of knowledge of refractory errors, could delay the early detection of such conditions in children, thus impacting the child's academic performance and quality of life.

Our findings also revealed that participants mostly consider medical staff and social media as sources of information about eye diseases. About 50.9% of the participants get their information about eye diseases from medical staff, and up to 43.2% use social media to get their information, which indicates the power of social media in improving the general awareness of the public in Aseer, Saudi Arabia, regarding pediatric ophthalmic conditions.

Taken together, our findings are the first to point towards the lack of knowledge of the parents and caregivers in the Aseer region of Saudi Arabia regarding pediatric ophthalmic conditions including strabismus, amblyopia, refractory errors, and congenital glaucoma, their signs and symptoms, risk factors, and treatment options. Our study suggests raising the awareness and general knowledge of the public in Aseer region, Saudi Arabia by creating focused educational programs through health care providers, schools, the media, and community groups geared towards parents and caregivers.

Our study has two main limitations. First, our sampling size is relatively small compared to the total population based in Aseer, Saudi Arabia. The explanation is that we utilized an online questionnaire to get our results, so only 597 participants had the time and opportunity to take the survey. Another limitation is that the data collected in this study relied on self-reported responses from parents. There is a possibility of response bias, as participants may have provided socially desirable answers or overestimated their knowledge level due to social desirability bias. Inaccurate

or incomplete reporting of information may have influenced the results and affected the reliability of the findings. Future research may extend this work by developing more cross-sectional studies regarding more pediatric ophthalmic conditions with a larger sampling size, which would better investigate the general awareness of the public, and trying to create innovative educational programs geared to people in Aseer, Saudi Arabia.

Conclusion

We designed a cross-sectional study geared towards parents and caregivers in Aseer, Saudi Arabia, to assess the prevalence of pediatric eye conditions including strabismus, amblyopia, refractory errors, and congenital glaucoma. Our study also aimed to investigate the general knowledge of parents regarding the signs, symptoms, risk factors, treatment options, and sources they utilize to get information about these conditions. Our findings indicated the low prevalence of pediatric ophthalmic conditions, including strabismus, amblyopia, refractory errors, and congenital glaucoma, among the public in Aseer, Saudi Arabia. In addition, most parents and caregivers lack basic knowledge about such conditions. Moreover, most parents who participated in our study rely on medical staff and social media as sources of information. So, our study suggests raising the general awareness of the public in Aseer, Saudi Arabia, by developing educational campaigns on social media platforms, schools, healthcare providers, and hospitals, which could significantly make the parents and caregivers more knowledgeable about the risk factors, signs, and symptoms of such conditions, which could help them earlier detect, treat, and maintain their children's eye health.

References

- Abolfotouh, M. A., Badawi, I., & Faheem, Y. (1994). Prevalence of amblyopia among schoolboys in Abha city, Asir Region, Saudi Arabia. *J Egypt Public Health Assoc*, 69, 19–30.
- Al Mazrou, A., Alsobaie, N. A., Abdulrahman, A. K. B., & AlObaidan, O. (2020). Do Saudi parents have sufficient awareness of pediatric eye diseases in Riyadh? *Saudi Journal of Ophthalmology: Official Journal of the Saudi Ophthalmological Society*, 34(3), 171–176. <https://doi.org/10.4103/1319-4534.310415>
- Aldebasi, Y. H. (2015). Prevalence of amblyopia in primary school children in Qassim province, Kingdom of Saudi Arabia. *Middle East Afr J Ophthalmol*, 22, 86–91.
- Alsaqr, A. M., & Masmali, A. M. (2019). The awareness of amblyopia among parents in Saudi Arabia. *Therapeutic Advances in Ophthalmology*, 11, 251584141986810. <https://doi.org/10.1177/2515841419868103>
- Al-Tamimi, E. R., Shakeel, A., Yassin, S. A., Ali, S. I., & Khan, U. A. (2015). A clinic-based study of refractive errors, strabismus, and amblyopia in pediatric age-group. *Journal of Family & Community Medicine*, 22(3), 158–162. <https://doi.org/10.4103/2230-8229.163031>
- Al-Yahya, A., Al-Odan, K., & Allam, K. (2012). Compliance to patching in the treatment of amblyopia. *Saudi J Ophthalmol*, 26, 305–307.
- Alzahrani, N., Alhibshi, N., & Bukhari, D. (2018). Awareness, perceptions and knowledge of amblyopia among pediatrics and ophthalmology clinics attendees in King AbdulAziz University Hospital, Jeddah. *Jeddah. Int J of Adv Res*, 6, 1506–1517.
- Bardisi, W. M., & Binsadiq, B. M. (2002). Vision screening of preschool children in Jeddah, Saudi Arabia. *Saudi Med J*, 23, 445–449.
- Barrett, B. T., Bradley, A., & Mcgraw, P. V. (2004). Understanding the neural basis of amblyopia. *Neuroscientist*, 10, 106–117.
- Bejjani, B. A., Lewis, R. A., & Tomey, K. F. (1998). Mutations in CYP1B1, the gene for cytochrome P4501B1, are the predominant cause of primary congenital glaucoma in Saudi Arabia. *Am J Hum Genet*, 62(2), 325–333.
- Bekibele, C. O., & Olusanya, B. A. (2006). Chronic Allergic Conjunctivitis: an Evaluation of Environmental Risk Factors. *Asian J. of Ophthalmol*, 8, 147–150.
- Bez, Y., Coskun, E., Erol, K., Cingu, A. K., Eren, Z., & Topcuoglu, V. (2009). Adult strabismus and social phobia: a case-controlled study. *J Aapos*, 13(3), 249–252.
- Bodunde, O. T., & Onabolu, O. O. (2004). Childhood eye diseases in Sagamu. *Nigerian J. of Ophthalmol*, 12, 6–9.
- Bourne, R. R., Stevens, G. A., White, R. A., Smith, J. L., Flaxman, S. R., & Price, H. (2013). Causes of vision loss worldwide, 1990–2010: A systematic analysis. *Lancet Glob Health*, 1, e339–349.
- Castenes, M. S. (2003). Major review: The under utilization of vision screening (for amblyopia, optical anomalies and strabismus) among preschool age children.
- Cotter, S. A., Varma, R., Tarczy-Hornoch, K., McKean-Cowdin, R., Lin, J., Wen, G., Wei, J., Borchert, M., Azen, S. P., Torres, M., Tielsch, J. M., Friedman, D. S., Repka, M. X., Katz, J., Ibrionke, J., & Giordano, L. (2011). Risk factors associated with childhood strabismus. *Ophthalmology*, 118(11), 2251–2261. <https://doi.org/10.1016/j.ophtha.2011.06.032>
- Dale, E., Fajardo, B., & Wilson, A. M. (2018). Pediatric Ophthalmology and Strabismus. *Pediatric Ophthalmology and Strabismus. American Academy of Ophthalmology*, 86–123.
- Darraj, A., Barakat, W., Kenani, M., Shajry, R., Khawaji, A., Bakri, S., Makin, A., Mohanna, A., & Yassin, A. O. (2016). Common eye diseases in children in Saudi Arabia (Jazan). *Ophthalmology and Eye Diseases*, 8, OED.S39055. <https://doi.org/10.4137/oed.s39055>
- De Zarate, B. R., & Tejedor, J. (2007). Current concepts in the management of amblyopia. *Clin Ophthalmol*, 1, 403–414.
- Donnelly, U. M. (2012). Horizontal strabismus worldwide – what are the risk factors? *Ophthalmic Epidemiology*, 19(3), 117–119. <https://doi.org/10.3109/09286586.2012.681002>
- Fatani, A.-A. A. (1994). Vision screening of preschool children in Riyadh. *Saudi J Ophthalmol*, 8, 9–14.
- Guo, K., Yang, D. Y., Wang, Y., Yang, X. R., Jing, X. X., & Guo, Y. Y. (2015). Prevalence of myopia in schoolchildren in Ejina: The Gobi desert children eye study. *Invest Ophthalmol Vis Sci*, 56, 1769–1774.

- Huang, H. M., Chang, D. S., & Wu, P. C. (2015). The association between near work activities and myopia in children - A systematic review and meta-analysis. *PLoS One*, 10.
- Isawunmi, M. A. (2003). Ocular disorders amongst school children in Ilesa east Local Government area.
- Kotb, A. A., Hammouda, E. F., & Tabbara, K. F. (2006). Childhood blindness at a school for the blind in Riyadh, Saudi Arabia. *Ophthalmic Epidemiol*, 13(1), 1–5.
- Ma, A.-R. (2010). Prevalence of refractive errors among pre-school children at King Abdulaziz Medical City, Riyadh, Saudi Arabia. *Saudi J Ophthalmol*, 24, 45–48.
- Nwosu, S. (1999). Childhood eye diseases in Anambra State, Nigeria. *Nigeria J. of Ophthalmology*, 7, 34–38.
- Pediatric Eye Disease Investigator Group. A randomized trial of atropine vs. patching for treatment of moderate amblyopia in children. (2002). *Arch Ophthalmol*, 120, 268–278.
- Pratab, V. B., & Lai, H. B. (1989). Pattern of pediatric ocular problem in North India. *India J Ophthalmol*, 37, 171–172.
- Rashed, A., Abdulrahman, B., Zarban, A. K., Almasri, A. A., Mirza, M. S., & Khandekar, A. S. (2017). Public awareness regarding common eye diseases among Saudi Adults In Riyadh City: A quantitative study. *J Ophthalmol*, 2017, 1–5.
- Robaei, D., Rose, K. A., & Ojaimi, E. (2006). Causes and associations of amblyopia in a population-based sample of 6-year-old Australian children. *Arch Ophthalmol*, 124, 878–884.
- Rose, K. A., Morgan, I. G., Smith, W., & Mitchell, P. (2002). High heritability of myopia does not preclude rapid changes in prevalence. *Clin Exp Ophthalmol*, 30, 168–172.
- Salman, M. S. (2016). Pediatric eye diseases among children attending outpatient eye. *iasj.net*. <https://www.iasj.net/iasj/download/a730d326a05026fe>
- Saw, S. M. (2003). A synopsis of the prevalence rates and environmental risk factors for myopia. *Clin Exp Optom*, 86, 289–294.
- Sethi, S. (2008). Pattern of common eye disease in children attending out patient eye department in Khyber teaching hospital. *J Med Sci*, 16(2), 99–101.
- Sharimawat, S. (2015). Associated Risk Factors Of Strabismus: The Sydney Childhood Eye Study. 2015, 2–291.
- Taylor, V., Bossi, M., & Greenwood, J. A. (2016). Childhood amblyopia: current management and new trends. *Br Med Bull*, 119, 75–86.
- Webber, A. L., & Wood, J. (2005). Amblyopia: prevalence, natural history, functional effects and treatment. *Clin Exp Optom*, 88, 365–375.
- Williams, C., Northstone, K., Howard, M., Harvey, I., Harrad, R. A., & Sparrow, J. M. (2008). Prevalence and risk factors for common vision problems in children: data from the ALSPAC study. *The British Journal of Ophthalmology*, 92(7), 959–964.
- Zhu, H., Yu, J. J., Yu, R. B., Ding, H., Bai, J., & Chen, J. (2015). Association between childhood strabismus and refractive error in Chinese preschool children. *PloS One*, 10(3).