



Anxiety in Children with Low Vision Secondary to Refractive Errors

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Abstract

Objectives: This study aimed to evaluate the anxiety status of children with low vision due to refractive errors using a questionnaire survey.

Methods: Between July and November 2019, the Screen for Child Anxiety Related Emotional Disorders (SCARED) questionnaire was administered to children with refractive errors ($\geq 3D$) and amblyopia who presented to the ophthalmology clinic. Children with low vision were evaluated based on their answers to the SCARED questionnaire.

Results: This study included 38 children (22 girls, 16 boys) with low vision. The average age of the participants was 9.74 ± 2.65 (7–12) years. The average binocular vision was 0.28 ± 0.21 LogMAR. The mean total anxiety score was 21.68 ± 10.55 . At least one type of anxiety was detected in 18 (47.4%) children. A positive correlation and statistical significance were found between binocular low vision and anxiety ($r=0.63$, $p<0.001$). Boys were more susceptible to anxiety than girls, and a positive moderate correlation and statistical significance were found ($r=0.50$, $p=0.002$).

Conclusion: Anxiety may develop in children with low vision, and this anxiety more commonly occur in boys than in girls ($p=0.002$). In addition, psychological disorders can be seen in children with low vision. To better evaluate this connection, large case series studies including visual impairment due to different reasons are needed.

Keywords: Anxiety, blindness, child, low vision, SCARED survey.

Introduction

According to the World Health Organization (WHO), visual loss of less than 6/18 but equal to or greater than 3/60 or a loss of visual field corresponding to less than 20° in the better-sighted eye of the best possible-corrected visual acuity is defined as “low vision.” “Blindness” is defined as visual acuity less than 3/60 or a loss of visual field less than 10° in the better-sighted eye with the best

possible correction. Visual impairment includes both low vision and blindness (1). According to WHO, 285 million people worldwide have visual impairment due to bilateral eye diseases and uncorrected refractive errors, and more than 90% of these people live in developing countries (2). In addition, seven million people have a visual impairment, and 10 million children have corrective refractive errors (refractive bilateral visual acuity less than 6/18) that cause visual impairment (3).

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Blind children have a life-long disadvantage that affects their opportunities for education and employment potential. Early-onset blindness also adversely affects psychomotor, social, and emotional development (4).

Anxiety disorders are considered the most common psychological and emotional disorders in children and adolescents worldwide (5). The reported prevalence of anxiety disorders in adolescents is 15% in the United States, and the 1-year prevalence in Korean children and adolescents aged 6–18 years is 11.7% (6,7). Despite such high prevalence rates, we found that treatment in children was focused on low vision; therefore, anxiety disorders often remain in the background. To the best of our knowledge, no large-scale studies have investigated this topic.

This study aimed to determine the anxiety status of children with low vision by using the Screen for Child Anxiety Related Emotional Disorders (SCARED) questionnaire. In addition to evaluating general anxiety symptoms, our SCARED survey can evaluate specific anxiety disorders, and compared with diagnostic clinical interviews, it is a more practical self-report scale that can be applied to a wide age range of 6–19 years (Table 1) (8).

Methods

Between July and November 2019, we administered the SCARED low vision questionnaire to children with refractive error ($\geq 3D$) and amblyopia who were brought to the Be-hcet Uz Children's Hospital Eye Policlinic. Local ethics committee approval was obtained for the study, and the study was conducted in accordance with the Helsinki Declaration (2018/249 KAEK 2018/19-07). After the content and possible results of the study were explained, written consent was obtained from all parents and children.

Patients

The inclusion criteria were as follows: Participants were children aged 7–12 years with vision <0.8 with the best-corrected visual acuity (BCVA), and the main cause of low vision was refractive error that led to amblyopia (corneal opacity, edema, trauma, strabismus, history of ocular surgery and ptosis, congenital cataract, congenital glaucoma, albinism, hereditary macular diseases, and deprivation amblyopia caused by albinism). The enrolled children were also required to cooperate with assessment using the vision chart and to answer the survey questions. In addition, we required

Table 1. The Screen for Child Anxiety Related Emotional Disorders (SCARED) scale

1. When I feel frightened, it is hard for me to breathe	23. I am a worrier
2. I get headaches when I am at school	24. I get really frightened for no reason at all
3. I don't like to be with people I don't know well	25. I am afraid to be alone in the house
4. I get scared if I sleep away from home	26. It is hard for me to talk with people
5. I worry about other people liking me	27. When I get frightened, I feel like I am choking
6. When I get frightened, I feel like passing out	28. People tell me that I worry too much
7. I am nervous	29. I don't like to be away from my family
8. I follow my mother or father wherever they go	30. I am afraid of having anxiety (or panic) attacks
9. People tell me that I look nervous	31. I worry that something bad might happen to my parents
10. I feel nervous with people I don't know well	32. I feel shy with people I don't know well
11. I get stomachaches at school	33. I worry about what is going to happen in the future
12. When I get frightened, I feel like I am going crazy	34. When I get frightened, I feel like throwing up
13. I worry about sleeping alone	35. I worry about how well I do things
14. I worry about being as good as other kids	36. I am scared to go to school
15. When I get frightened, I feel like things are not real	37. I worry about things that have already happened
16. I have nightmares about something bad happening to my parents	38. When I get frightened, I feel dizzy
17. I worry about going to school	39. I feel nervous when I am with other children or adults and I have to do something while they watch me (for example: read aloud, speak, play a game, play a sport)
18. When I get frightened, my heart beats fast	40. I feel nervous when I am going to parties, dances, or any place where there will be people that I don't know well
19. I get shaky	41. I am shy
20. I have nightmares about something bad happening to me	
21. I worry about things working out for me	
22. When I get frightened, I sweat a lot	

that the mother or father voluntarily allow their child to answer the survey questions, and the child should not have any known psychiatric illnesses and have no history of surgery or closure treatment due to low vision. Those who did not meet the inclusion criteria were excluded.

BCVA was determined using Snellen vision chart in children. The results, which were in decimal point system, were then converted to logMAR using the conversion table. In children with low vision, the SCARED questionnaire was given and their answers evaluated.

Statistical Analysis

The e-PICOS (NewYork, USA) program was used for the statistical analysis. The Kolmogorov–Smirnov test was used to evaluate the normality of data distribution. After assessment of the demographic data, Pearson correlation analysis was used to evaluate the correlation between the data. Statistical significance was accepted as $p < 0.05$.

Results

This study enrolled 38 children (22 girls, 16 boys) aged 7–12 years. The mean age of the participants was 9.74 ± 2.65 years, and the participants’ binocular vision was 0.28 ± 0.21 LogMAR. The mean total anxiety score was 21.68 ± 10.55 (Table 2). At least one type of anxiety was detected in 18 (47.4%) of 38 cases. Of these, two anxiety cases were observed in 11 participants and three cases in one participant. Anxiety distributions in children are shown in Figure 1.

In the Pearson correlation analysis, a positive correlation and statistical significance were found between binocular low vision and anxiety in children ($r = 0.63$, $p < 0.001$). Boys were more susceptible to anxiety than girls, and a positive moderate correlation and statistical significance were found ($r = 0.50$, $p = 0.002$). The average number of children in the families was 1.42 ± 0.50 , and no statistical significant difference was found between the average number of children and anxiety ($p = 0.56$). Moreover, no significant relationship was noted between age and anxiety in children ($p = 0.40$).

Discussion

This study investigated the prevalence of anxiety in school children aged 7–12 years with low vision. Our results sug-

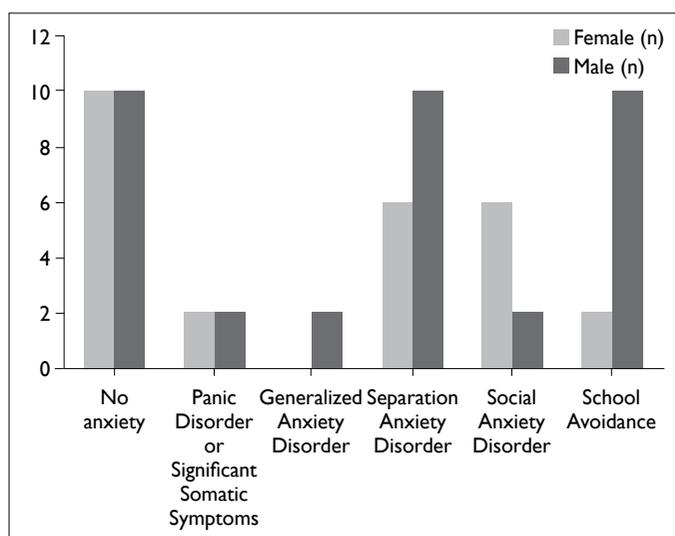


Figure 1. Anxiety distributions in children..

gest that boys with low vision are more susceptible to anxiety than girls ($p = 0.002$).

In the literature, male pediatric patients and adults more often sought hospital treatment for low vision (9,10). However, in the present study, patients with low vision were mostly girls (57.9%). The possible reason is that we excluded non-refractive amblyopia causes such as trauma, which is more common in the male population (11,12).

Decarlo et al. evaluated the vision and quality of life of 24 children aged 6–12 years with low vision due to various reasons, and they found psychosocial disorders in 66% of these children (13). In the present study, 47.4% of children with low vision due to refractive errors had at least one type of anxiety. Our exclusion of other causes and inclusion of only patients with low vision due to a refractive error may have had an effect on this finding.

Studies have shown that children with low vision can exhibit different emotional and physical behaviors and even exhibit psychiatric behaviors such as anxiety (14–16). Similarly, we found a positive correlation and statistical significance between anxiety and binocular low vision in children ($r = 0.63$, $p < 0.001$).

A school-based study investigated the effect of visual impairment on the health-related quality of life in adoles-

Table 2. Average age, total anxiety score and binocular vision of the cases by gender

	Female (n=22)	Male (n=16)	Total (n=38)
Age (year), mean±SD	10.55±3.04	8.63±1.45	9.74±2.65
Binocular vision (LogMAR), mean±SD	0.23±0.20	0.33±0.21	0.28±0.21
Total anxiety score, mean±SD	17.27±9.08	27.75±9.55	21.68±10.55

*SD=Standard deviation.

cents aged 11–18 years and found that visual impairment and refractive errors did not impair the quality of life of this population (17). In the present study, a high correlation was observed between low vision and anxiety. This is because our study group includes children aged 7–12 years, suggesting that younger children may fail to fight anxiety caused by low vision.

In addition, the quality of life was low in studies that have examined the effects of diseases such as cystic fibrosis and epilepsy on psychiatric morbidity and quality of life of children and adolescents (18–21). For this reason, other studies have suggested the development and implementation of screening programs to detect refractive errors among children by country (22–24).

In the present study, the average number of children among families has no effect on the frequency of anxiety among children. To our best knowledge, no studies have comprehensively investigated this issue.

As limitations, our study has a relatively small sample size, so the results cannot be generalized for the entire population. In addition, we did not have a control group. As regards its strengths, our study followed a prospective design and evaluated only a certain group of patients with amblyopia caused by a refractive error.

In conclusion, children with low vision may also have psychological disorders. These accompanying psychological problems are more common in boys than in girls. Delayed psychological assessment and treatment to these children with low vision can cause permanent psychological disturbances. However, for better evaluation, large-scale studies including visual impairment due to various causes are needed.

Disclosures

Ethics Committee Approval: This report was approved by the research ethics committee of the University of Health Sciences Dr. Behçet Uz Child Disease and Pediatric Surgery Training and Research Hospital, Izmir, Turkey, and followed the tenets of the Declaration of Helsinki (2018/249 KAEK 2018/19-07).

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

Authorship Contributions: Involved in design and conduct of the study (SB); preparation and review of the study (SB, IP); data collection (SB, DE); and statistical analysis (SB, DE).

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