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The association between vision quality of life and academics as measured by the College of Optometrists in Vision Development Quality of Life questionnaire

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BACKGROUND: Undetected visual problems are one of the causes of academic difficulties in the classroom. An easily administered screening device that identifies children who are likely to do poorly in school because of vision problems would be a valuable tool. The screening should be able to be performed by a classroom teacher or aide. The objective of this study was to determine if there was an association between vision-related quality-of-life factors (19-item College of Optometrists in Vision Development Quality of Life [COVD-QOL] questionnaire checklist) and academic performance. A secondary objective was to determine whether student and parent responses to the questionnaire would be similar.

METHODS: Ninety-one parents or guardians and their children, attending the third, fifth, and seventh grades in a public school participated in this study. Both the parent or guardian and student independently completed the checklist. The scores of both groups were compared with the Stanford IX test scores for total reading, total math, total spelling, and total battery scores of the Stanford IX. The parent or guardian and student scores were compared to evaluate the agreement (intergroup reliability).

RESULTS: Parent or guardian and student checklist scores were compared. The Wilcoxon Signed Rank test showed that the mean scores for the parent or guardian were significantly lower than for third grade students and also for the total sample. Visual symptoms were found to be inversely correlated to academic performance; the lower the academic score, the more symptoms were reported. Symptoms reported by third grade students and their parents tended to be more highly correlated with academic scores. In general, symptoms reported by the parent were more highly correlated with academic score than the symptoms reported by the student.

CONCLUSION: The COVD-QOL questionnaire is a cost-effective, quick, and easy tool that may be used in school screening to identify possible visual symptoms that are correlated to academic performance.

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The prevalence of visual problems in children is significant.[1-5] More than 10 million children suffer from dysfunctional visual conditions.[2] An estimated 16% of preschoolers have visual deficiencies, and as many as 21% of students in the lowest economic quartile drop out of high school each year.[3] A high percentage of these undetected vision problems (oculomotor, binocular, accommodative, and perceptual) are associated with those children who drop out of school and are later involved in the juvenile court system.[4,5]

Many components, such as educational, visual, auditory,

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medical, social, family, and psychological factors, contribute to an individual's academic success.[6,7] When any of these factors are compromised, a child is at a higher risk of doing poorly in school. A majority of these academically at-risk students are from poorer socioeconomic backgrounds,[8] but visual factors have been found to be a better predictor of academic success than are race and/or socioeconomic status. [7]

The development of the visual system gradually evolves from infancy into childhood. The most active period of change is during the first 4 years of life.[9,10] Ocular pathology, high refractive error, amblyopia, binocular disorders, accommodative disorders, and deficient depth perception are all potential visual problems. Visual motor, visual perception, and visual cognitive (visual information processing) factors can also interfere with a child's academic performance and ability to succeed in school.[7,8,11-14]

When visual symptoms develop, the child often finds ways to avoid or reduce these symptoms.[15] Inappropriate behavior from a vision problem can lead to an inappropriate diagnosis of a learning disability or attention deficit.[15-19] Children diagnosed with attention deficit disorder or attention deficit hyperactivity disorder (ADD/ADHD) exhibit more visual quality-of-life symptoms than similar groups of non-ADD/ADHD children.[20] The early detection and prevention of vision problems is important.[21,22] Most states only require vision screenings, which are inadequate.[23-25] Children who pass an eyesight screening may have visual skills or information processing problems that often are overlooked with screenings.[23-25]

Questionnaires are a quick, easy, and cost-effective way to collect meaningful data.[24,25] The College of Optometrists in Vision Development (COVD) Quality of Life Outcome Assessment Task Force developed and published a 30-item questionnaire ([COVD-QOL]; *see* Appendix A)[26] that allows clinicians to better describe visual symptoms and quantify changes attributed to optometric intervention, specifically with lenses and vision therapy. Each item is marked, and a numerical score is assigned. "Never" is 0 points, "seldom" is 1 point, "occasional" is 2 points, "frequently" is 3 points, and "always" is 4 points. A total score greater than 20 is of concern and suggests that further evaluation is needed.[27] Although the COVD-QOL measures symptoms, it is implied that the quality of one's life is negatively affected by these signs and symptoms. Headaches, for example, can diminish one's quality of life by keeping a person in constant pain. Diplopia, dizziness, and nausea can seriously affect a person's daily activities.

The COVD-QOL questionnaire elicits measurements of visual symptoms, and has good test–retest reliability.[27,28] ADD/ADHD children have been shown to have significantly higher COVD-QOL scores than age- and gender-matched, non-ADD/ADHD children.[20] Each of the 30 items has been shown, cumulatively and individually, to be decreased significantly after optometric vision therapy.[29] The COVD-QOL questionnaire is used to enhance an optometrist's ability to educate patients about treatment, or as a test–retest tool to help establish effectiveness of vision therapy allowing the patient or parent or guardian to make a more informed decision about treatment strategies.

On occasion, the COVD-QOL questionnaire has been criticized by patients in a clinical setting as being too lengthy and difficult to complete. A shorter version was developed, consisting of 19 of the most attributable quality-of-life symptoms ([checklist]; *see* Appendix B). The short form was found to have acceptable test–retest reliability.[28] Because the checklist consists of those items on the 30-item checklist that typically receive the highest scores, it is reasonable that the scores for the short list would be similar. (The items not included in the checklist most often were scored as never or 0.) The checklist is, therefore, scored in the same manner as the 30-item questionnaire. A total score of 20 and above is a concern, and further evaluation is indicated.

The Stanford Achievement Test, ninth edition (Stanford IX), is used by many Arkansas schools to measure a child's achievement in reading, mathematics, language arts, science, and social science.[30] It allows comparison of individual students with other students in the same grade across the nation. It is a well-established, standardized, and well-accepted test of academic achievement. The objective of this study was to determine if there is an association between the symptoms checklist and academic achievement as measured by the Stanford IX test. A secondary objective was to determine if student and parent symptoms checklist scores would be similar.

Methods

Consent and assent forms were developed and approved by the University Human Experimentation Advisory Committee and the public school board. A packet was developed that contained the consent and assent forms and the COVD-QOL. The packets were distributed to each of the third grade (n = 66), fifth grade (n = 68), and seventh grade (n = 75) children (total n = 209) to deliver to their parent or guardian. Before distributing the packets, each teacher assigned a unique identification number to each student in that child's respective classroom and labeled the parent or guardian questionnaire in each packet with the same number. The names, corresponding to the identification numbers, were kept confidential by the school district.

The consent and assent forms were completed and signed by each student and parent or guardian of the children who agreed to participate in the study. The parent or guardian then completed the symptoms checklist concerning their child. The parent or guardian mailed the completed forms to the University in a provided, self-addressed, stamped envelope. One week after the packets were distributed, a reminder letter was given to each student to deliver to that child's parent or guardian. Three weeks after the initial distribution, the superintendent was provided with a list of