

Article ▶ Michigan Teachers' Opinions on the Efficacy of School Vision Screenings

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ABSTRACT

Background: According to the American Public Health Association, 10% of children under the age of five have eye or vision problems. Currently in the State of Michigan, vision screenings are held prior to entering kindergarten, in grades 1, 3, 5, 7, and 9, and again as part of driver's training. However, a vision screening can miss vision problems. This study collects and analyzes Michigan teachers' opinions about school vision screenings and the visual learning process.

Methods: Online surveys were sent via email to 500 elementary teachers from randomly selected elementary schools throughout the State of Michigan. The survey asked about current vision screenings conducted in the school and whether teachers feel that these screenings are sufficient for detecting vision problems. The survey also asked if the teachers would like more education on vision and its effect on the learning process, among other questions.

Results: Of 78 responding teachers, 100% agree that vision impacts a child's performance in every subject, as well as standardized testing. Approximately 85% of teachers agree that vision screenings should be performed every year, while 80.8% agree that children should have a comprehensive eye examination by an eye specialist before entering first grade. Over half of these believe that Michigan law should mandate this examination. Approximately 60% of respondents are interested in implementing a computer software program that works on eye tracking skills as well as math and reading, while 71.8% are interested in implementing non-computer activities such as worksheets or games.

Conclusions: Michigan elementary teachers overwhelmingly support children having a complete eye examination prior to first grade, and most feel that it should be mandated by state law. Teachers agree that school vision screenings detect some, but not all, vision factors that may influence a child's academic performance. Teachers would utilize eye tracking activities if they were available.

Keywords: educators, eye tracking, pediatrics, teachers, vision and learning, vision screening

Introduction

According to the American Public Health Association, about 10% of children under the age of five have eye or vision problems.¹ It is well established that vision and learning are related. In fact, problems with the visual system can hamper a child's ability to perform up to his or her full potential.^{2,3} In many cases, teachers are the first to notice learning and vision problems in elementary-aged children, as they spend the majority of the working day with the child. School vision screenings for children are an important part of catching major vision problems such as refractive error, abnormal phoric postures, strabismus, amblyopia, ptosis, unequal pupils, nystagmus, and gross eye abnormalities.^{1,4} However, vision problems such as poor eye tracking, suppression, and convergence insufficiency often go undetected with typical in-school screenings.⁵⁻⁸

Currently in the State of Michigan, vision screenings are held prior to entering kindergarten, in grades 1, 3, 5, 7, and 9, and again as part of driver's training through the Michigan Department of Community Health.^{1,9,10} Michigan state law mandates these vision screenings.¹⁰ However, school vision

screening programs vary in the sensitivity and specificity results of the instruments and methods utilized. Therefore, judging their generalized effectiveness becomes a difficult task. Some organizations and individuals within the optometric community and educational field believe that children should have a thorough eye examination with an eye care professional before entering first grade in addition to or as a replacement for school vision screenings.¹¹⁻¹³ In addition to the methods used, the process for referring a child who fails a vision screening for an eye examination varies by local health department but should include paperwork given to the parent/s to be completed by the eye care provider and returned to the state hearing and vision screening program.¹⁴ Teachers are faced with these issues with regard to the best interest of their students, so gaining their perspective will provide valuable insight into future political and interdisciplinary discussions.

Methods:

The study received approval from the Ferris State University Institutional Review Board before it commenced. An online survey was dispersed to elementary school teachers

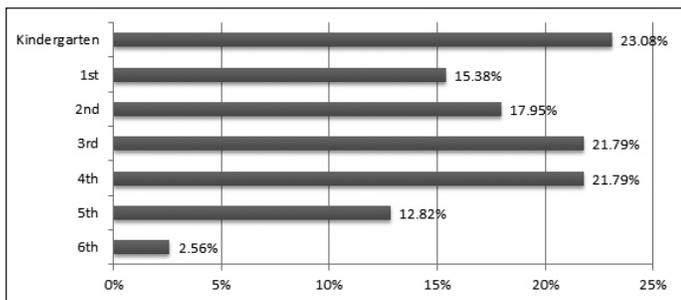


Figure 1: Grade taught by responding teachers

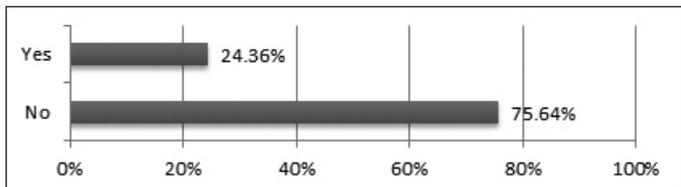


Figure 2: Whether vision screenings flag all vision problems

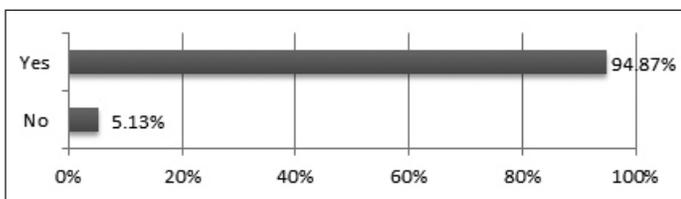


Figure 3: Whether vision screenings flag some vision problems

to assess their knowledge and concerns regarding school vision screenings and whether they feel that a complete eye examination for young children should be mandated, among other questions. Surveys were dispersed via email (Appendix A) to 10 teachers of grades kindergarten to sixth grade in 50 randomly selected elementary schools throughout Michigan. The survey was designed to reach 500 teachers within those 50 elementary schools. The response rate goal was set at 20%, equaling 100 responses. Teachers were directly emailed, and their email addresses were obtained from the schools' websites. The survey was internet-based, and the teachers were given a link to www.quicksurveys.com to complete it anonymously. The survey asked about the current vision screenings conducted in their school and whether they feel that these screenings are sufficient for detecting vision problems. The teachers were also asked about vision and academic performance, whether they felt that children should have a complete eye examination by an eye care provider before entering first grade, and whether that eye examination should be mandated by state law. The survey also included questions about the current referral system if a student should fail the school vision screening. In addition, the survey asked if the teachers would implement activities into their curriculum that helped children with eye tracking and if they would like more education on vision and its effect on the learning process. The survey was made available for two weeks after the first email was sent. A second email was sent one week after the initial invitation to all teachers as a reminder to complete the survey.

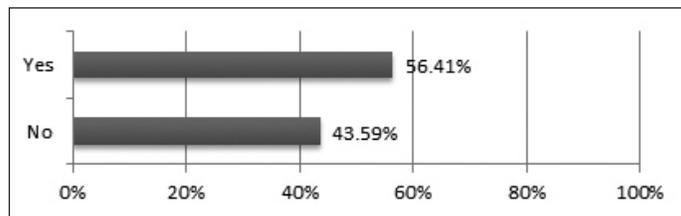


Figure 4: Satisfaction with sensitivity of vision screening

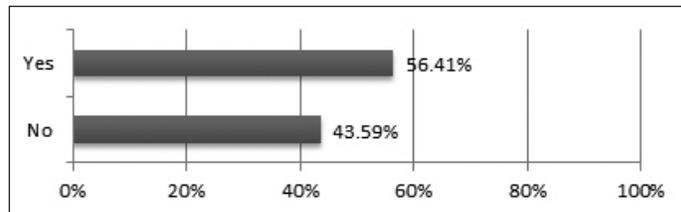


Figure 5: Effectiveness of referral system for children failing vision screening

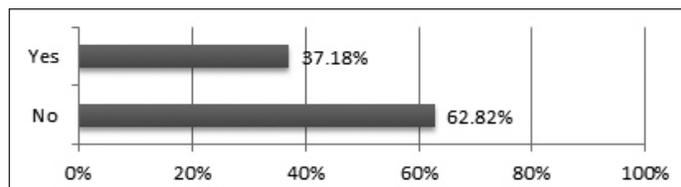


Figure 6: Awareness of eye care provider to whom to refer child failing screening

Results:

The survey was emailed to 500 teachers in 50 randomly selected elementary schools. The response rate was less than the 20% goal with seventy-eight teachers responding to the survey, representing 15.6% of the total teachers contacted. The response rate was influenced by school webpage filters and restrictions evidenced by emails from teachers who wanted to complete the survey but were unable. The teachers who did complete the survey represented 29 out of the 83 counties in Michigan, and about 78% have been teaching over 10 years. The majority of responses were received from kindergarten teachers at 23.1% and the fewest from 6th grade teachers at 2.6% (Figure 1). Approximately 72% of respondents live in semi-rural or rural areas with a population of less than 50,000.

In an effort to learn more about vision screenings across Michigan, the survey involved multiple background questions about vision screenings. Just over half of the teachers, 53.9%, reported that vision screenings were conducted every two years in their school, and the majority of teachers, 84.6%, agreed that screenings should be performed every year. Approximately 32% reported that students are screened every year. Surprisingly, 5.1% of teachers reported that there are not any vision screenings in their district. Approximately 76% of teachers feel that vision screenings do not catch all vision problems that may impede a child's educational success, while 95% of teachers would argue that at least some vision problems are flagged (Figures 2 and 3). Approximately 13% of respondents are dissatisfied with the

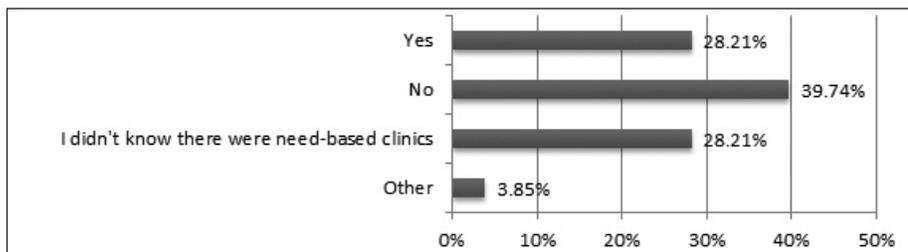


Figure 7: Awareness of need-based clinics

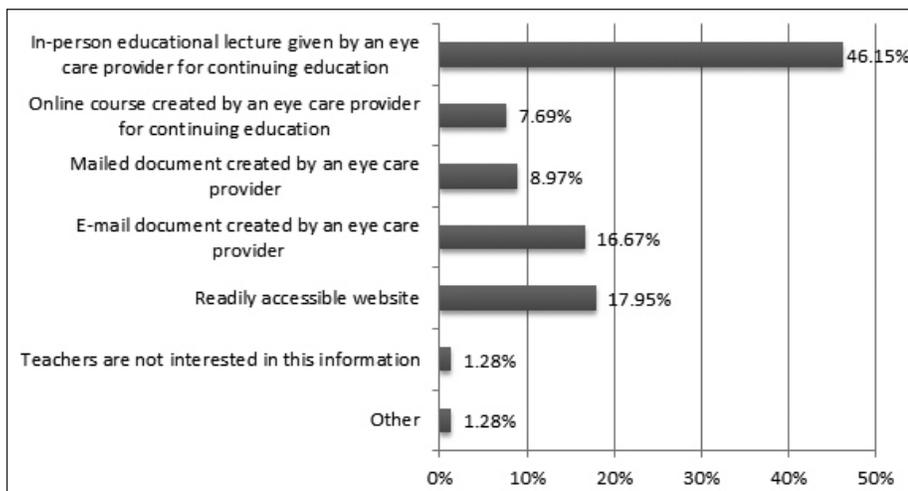


Figure 8: Preferred delivery system for teacher education on vision and learning

procedures used in the vision screenings to detect problems that might impede a child's educational success, while 27% are neutral. Almost 17% are dissatisfied with the sensitivity of the screening in detecting vision problems, with 37.2% being neutral (Figure 4). The majority of respondents, at about 76%, have reported that the local health department conducts the vision screenings. Interestingly, 3.8% of teachers reported that an eye care provider conducts the vision screenings at their school district, whereas about 9% are unsure as to who is conducting the screenings.

Not surprisingly, 100% of respondents agree that vision affects a child's performance in every subject and that a vision problem could detrimentally affect a child's performance on standardized testing. An astounding 80.8% of teachers would agree that a comprehensive eye examination would be beneficial for students prior to entering first grade, while 56.8% of teachers believe it should be mandated by Michigan Law.

Importantly, 43.6% of respondents are concerned that the referral system upon failing a vision screening is not effective (Figure 5). Sadly, 62.8% of respondents are not aware of a pediatric eye care professional to whom they can send referrals upon noticing visual symptoms that may warrant a comprehensive eye examination (Figure 6). Similarly, 39.7% of teachers are unsure of the nearest need-based clinic, while another 28.2% were unaware that need-based clinics existed at all (Figure 7).

Sixty percent of teachers are interested in implementing a computer software program that works on eye tracking skills, as well as math and reading, while 71.8% were interested in implementing non-computer activities, such as worksheets or games. The majority of respondents, at a little less than 35%, prefer a lecture by an eye care professional in order to learn more about visual-based symptoms, whereas 25.6% and 21.5% prefer an e-mailed document or a website, respectively. The majority of respondents at 46.2% also prefer a lecture over other methods to learn more about visual information processing and vision-related learning problems (Figure 8). Please see Appendix B for comprehensive survey results.

Discussion:

Despite the response rate, the survey provides valuable information concerning school children's vision in Michigan. A majority of the teachers have been teaching for over 10 years, implying that most of the responding teachers are experienced with observing their students' needs and struggles in the classroom. The teachers who responded represent 29 different counties in Michigan, creating a wide range of backgrounds within various communities encompassing different socio-economic environments and community populations. The survey participants fairly represent each elementary grade level, including K-6. This stratification is helpful since different visual symptoms and deficiencies commonly arise at certain grade levels. Overall, the survey participants are diverse and provide a good representation of elementary school teachers across Michigan despite some selection bias in that those completing the survey likely represent the more engaged and conscientious teachers.

There is inconsistency in how often children receive vision screenings in the schools. This is in contrast to Michigan state law mandating that these screenings occur every two years beginning in first grade and ending in ninth. For the 5% of teachers reporting that their students do not undergo vision screenings at school, it is concerning that some schools are not following state mandates, although it is possible that respondents are simply unaware that the screenings are occurring. Children who fail a vision screening in Michigan are often screened again the next year instead of waiting the normal two years.^{9,10,14} This may explain teacher confusion about whether the screenings are occurring yearly or every two years. The United States Preventative Services Task Force recommends vision screenings be performed on children ages 3-5 years at least once.¹⁵ The reason that vision screenings are

not being performed is unclear; however, one can postulate that it is likely a combination of lack of funds and/or awareness. Further, 85% of Michigan teachers agreed that vision screenings should be provided every year, supporting consideration of possible change in the state mandate.

Some teachers who were not satisfied with their school screenings had suggested that vision screenings should be performed yearly in hopes of catching children with vision problems as soon as possible. That way, students are less likely to fall behind in coursework and learning; the sooner a vision problem is found in a child, the quicker it can be treated. For example, although plastic at any age, the brain is most plastic during childhood, especially with regard to acuity.¹⁶ If amblyopia is diagnosed secondary to strabismus or refractive error, the best outcomes occur when treated before age nine even though positive change is possible at any age.¹⁶ Earlier intervention to improve visual skills, such as tracking, helps to alleviate problems that may hinder reading or learning. Further, if school vision screenings included pursuits and saccadic testing, deficiencies in these eye movements would be recognized sooner. Saccadic insufficiency is known to be linked to reading problems. If saccadic insufficiency is diagnosed and therapy is implemented, a child's success in the classroom could improve dramatically.¹⁷

Since only a meager 12% of teachers were completely satisfied with their school's vision screenings, and another 13% were dissatisfied, most teacher responses clustered around neutral. Respondent comments stated that the vision screenings are outdated and that eye tracking and eye teaming should be a part of the screening. One teacher responded that a child passed the school screening but continued to have problems, at which point the parent took the child to an eye doctor who found the problem. In addition, some respondents pointed out that the children's responses may not be accurate, especially at the kindergarten level, due to the anxiety of the situation. Based on these comments, if vision screenings are performed by eye care providers or someone trained by eye care providers, the sensitivity and specificity may increase. In fact, a study performed in Kentucky in 2007 suggested that a comprehensive vision examination performed by an eye care provider identified some vision problems that were missed in children's preschool vision screenings held by the state. In that study, 66 children were diagnosed with a vision problem by an eye care provider, while only 10 of those same children were diagnosed at the school's initial vision screening.¹⁸ This suggests that comprehensive vision examinations by eye care providers are more sensitive than school vision screenings.

When asked about the sensitivity of school vision screenings, the majority of responses were neutral. The large majority of respondent teachers also agreed that the vision screening process is thorough enough to flag some but not all of the vision problems that could potentially impede a child's educational success. These findings suggest that teachers realize the limitations of screenings and their

inability to flag certain conditions or problems, sort of a "something is better than nothing" approach. Respondents agreed overwhelmingly with the importance of complete eye examinations for children prior to beginning school, but their responses seem to acknowledge that when examinations do not occur, vision screenings are helpful.

A promising result was that all respondents agreed that vision affects a child's performance in every subject and that a vision problem could detrimentally affect a child's performance on standardized testing. With the current emphasis on the importance of standardized testing as teacher and school evaluation tools, this leads to questions about why school districts have not explored improvement and remediation of student vision problems as a funding priority.

Most teachers also replied that they would be interested in implementing a computer software program and non-computer activities that would improve eye tracking while also working on regular subjects, such as math. This result indicates the importance of eye tracking to reading and learning from the teacher perspective. However, in the comments, some teachers showed concern about not having time to add this to their current curriculum nor the computers to realistically use the software in the classroom. One teacher had suggested these skills may be best worked on at home just as many optometric vision therapy programs operate.

An overwhelming majority of teachers said that children should have a complete eye exam by an eye care provider before entering first grade and not just attend a school vision screening. Over half of the teachers responded positively for the implementation of state law requiring a child to receive a complete eye exam by an eye care provider before entering first grade. Teachers appear very aware that vision affects a child's learning potential and future success in the classroom. Teachers seem to understand the benefits of a comprehensive eye exam over school screenings. They want to see their students succeed and seem to agree that receiving eye examinations is a way to help ensure optimal academic performance. Also, the survey question should have been reworded, asking, "based on the fact that there are need-based clinics, do you think it should be Michigan law to require a comprehensive eye examination prior to entering school?" It would be interesting to determine how many of the negative responses with regard to a state law would be persuaded to respond positively when financial need is not a limiting factor.

Unfortunately, the majority of teachers do not know of a pediatric eye care provider to whom to refer their students if they notice vision problems. This result might be influenced by the caution schools must take in making referrals to a certain provider to avoid political and legal pitfalls. A significant number of respondents, about 44%, felt that their school's current referral system was ineffective. It would be interesting to contrast this finding with teacher opinions in other states that may have different referral or follow up protocols following a failed vision screening. Although not

addressed by this study, further research on optimal school referral systems is indicated.

It is important for primary care and pediatric optometrists to educate teachers and local schools on their services in hopes that the information may be passed along to parents of students in need of pediatric eye care services. In addition, educating teachers on vision and learning appears important to them, indicating that they likely feel inadequately educated on the topic or would like additional information. The majority of teachers responded that an in-person educational lecture given by an eye care provider would be the most effective way of conveying information to them about both visual information processing and symptoms of vision related learning problems. Most others said that an emailed document created by an eye care provider or an informational website would be effective. In-services and emailed, printed, or website symptom checklists appear to be optimal ways to educate teachers based on survey results and are easily accomplished if eye care providers are given access to teachers. As eye care providers, it is not only our job to offer comprehensive eye exams for children, but also to educate teachers and the community about children's eye care and vision related learning problems when we are able. By simply reaching out to schools in our communities and meeting with school administrators and teachers, optometrists can make a huge impact on a child's visual well-being as well as their learning potential in school. There are challenges inherent in making connections with local schools, the most formidable of which is simply being allowed access because of political and legal reasons. Other challenges may include lack of teacher time to attend education, lack of continuing education credit for teachers who attend non-accredited presentations, and the perception of the relative unimportance of vision-related topics in the scheme of everything teachers must know to remain current in times of changing standards.

The new health care reform law, the Patient Protection and Affordable Care Act, addresses children's vision. The health care law highlights children's vision as an essential health benefit.¹⁹ At this time it is unclear as to which services and/or vision needs will be covered for children, but, at the very least, a comprehensive eye health exam will be insured. With vision coverage starting in 2014, children should be able to get an eye exam before entering the first grade as a covered benefit. However, how children's vision services will be defined remains to be seen, and the screening versus comprehensive eye examination debate will surely remain a part of this discussion.

Conclusion:

Michigan elementary teachers are keenly aware of the importance of vision in learning and standardized testing. They also recognize that while vision screenings are important, their effectiveness is limited. They overwhelmingly agree with the importance of comprehensive eye examinations prior to first

grade for all children. The eye care community must serve as a key player in deciding whether it wishes any change to come about in the school vision programs, and, if so, it is obvious that we need to educate the front lines: legislative leaders, state officials, school administrators and staff, teachers, and parents. As primary eye care providers, optometrists should be eager to provide an annual continuing education course to teachers, educating them on signs and symptoms of vision problems and the relationship between vision and learning. As confirmed by this survey, vision screenings are not comprehensive enough to detect all vision problems. Vision problems that go undetected may cause students to struggle throughout their learning career. Many vision problems or impairments are preventable if an eye care provider appropriately diagnoses and treats the patient. As partners with our educational system, eye care providers can help innocent young minds remain unburdened by visual problems by promoting or even requiring a comprehensive eye examination for all children prior to entering the first grade in a fashion similar to immunizations or medical examinations.

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