

Vision Problems in Children

An Examination of the Vision Problems and Access to Vision
Services among Children in Washington

Prepared by:

AMERICORPS CHILD VISION PROJECT

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Introduction

What is the AmeriCorps Child Vision Project?



The AmeriCorps Child Vision Project, established in 2010, is an AmeriCorps project that strives to increase awareness and education about child vision problems in Central and Eastern Washington, and advocates for change on a local and state level to create access to timely, quality, and comprehensive vision care.

The Child Vision Project was created as a response to the inadequate vision care children receive in the State of Washington. Children require regular testing by an eye care professional in order to maintain healthy eye development. The high percentage of children in care who required some form of vision treatment suggests that children in the state of Washington are not receiving an adequate level of vision care. Programs like the Child Vision Project are important to ensure that children in the state of Washington receive adequate vision care.

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Executive Summary

Vision problems are prevalent worldwide and in the United States, and can be extremely detrimental to children. There is high prevalence of vision problems among children in the United States across ethnic and socioeconomic groups. Vision screening and comprehensive vision exams are both important methods to catch undiagnosed vision problems. However, not every child has access to vision screenings and even fewer have regular access to comprehensive vision exams.

Three types of vision problems affect children: eye health problems, vision acuity problems, and binocular vision problems. Vision problems can cause learning problems because of the way in which the visual system is used for academic performance. Children who cannot see well may have difficulties with schoolwork. Visual factors have been found to be a better predictor of academic factors than race or socioeconomic status. In order to prevent vision related learning problems early detection and treatment is important. It is important to do this early before a child gets behind in school. There needs to be more advocacy and research to address vision problems, which can have lasting and widespread consequences if left untreated.

Untreated vision problems can be costly. There can be enormous costs to education that could potentially be saved by early detection and treatment. However, cost can also be prohibitive to people looking for vision services, and this must be addressed so that individuals are able to adequately treat their vision problems. The costs of ignoring the problem can have high societal costs in addition to costs to an individual's quality of life. Vision problems can complicate co-existing conditions and increase the expense of addressing these conditions as well. One way to combat the costs of undetected vision problems is by increasing access to vision services.

Certain populations may be at higher risk for not having access to vision services, thus leading to undetected vision problems. One in particular is foster children. In addition, rural communities have less access to vision services. Native Americans have high rates of undetected vision problems.

A solution to address this issue may be to integrate vision care into existing services. The AmeriCorps Child Vision Project is an example of how this can be done. The program was created in 2010 to work with caseworkers and foster families to help facilitate access to vision services. It was found that 44% of children had undetected vision problems. This is similar to a 2000 study of foster children in New York City that found that 44.4% of foster children had undetected vision problems. These figures exemplify the importance of programs that increase access to vision services for needed populations.

Prevalence of Vision Problems

The Numbers

Vision is an important aspect of health care that is often overlooked, even though it is estimated that there are 259 million people worldwide with vision impairment (Dandona & Dandona, 2006). In the United States, it is estimated that there are approximately 14 million people age 12 and over with vision impairment (Vitale, Cotch, & Sperduto, 2006). Eleven million of these people have vision impairments, which are refractive errors that could be alleviated by refractive correction, such as eyeglasses (Vitale, Cotch, & Sperduto, 2006). Table 1 shows the different numbers in literature, in regards to child vision impairment.

Table 1: Child Vision Impairment– Publications and Key Findings

2002 Centers for Disease Control and Prevention (CDC) Report

- Rate of vision impairment in children was at 2.5%
- Hispanic children have a significantly higher percentage of reported vision impairment than white children (3.8% versus 2.3%)
- Children who live in families below the federal poverty level were nearly twice as likely to have vision impairments as children from families at or above 200% of the poverty level

Kodjebacheva, Brown, Estrada, Yu, and Coleman (2011). *Uncorrected Refractive Error Among First-Grade Students of Different Racial/Ethnic Groups in Southern California: Results a Year After School-Mandated Vision Screening.*

- 8.0% of the children had decreased vision acuity

Harvey, Dobson, and Miller (2006). *Prevalence of High Astigmatism, Eyeglass Wear, and Poor Visual Acuity Among Native American Grade School Children.*

- 35% of the children tested had poor vision acuity

Register (2010). *Visual acuity and stereopsis screening results in an underserved community.*

- 37.4% of children tested had poor vision acuity
-

In most of the studies to date, children are at high risk for vision impairment, but those at highest risk are the children who are already at risk for so many other health problems: children from low-income families, children of color, and foster children. One of the many dangers of ignoring the problem of vision in high-risk

children is that their development may be hindered by their lack of ability to see well. This can affect educational performance and overall outcomes.

By not addressing vision needs in children who need help the most, they are being set up to be unable to succeed and reach their full potential. To prevent vision problems, it is imperative that vision development in children is monitored. Efforts are being made to mitigate this. One of the goals of Healthy People 2020 is to increase access to vision care through eight initiatives. Two of these initiatives, V1 and V8, are directly related to improving access to children and the disadvantaged. Objective V1 seeks to increase the percentage of children who have vision tests as preschoolers. Objective V8 seeks to increase access to comprehensive vision services at Federally Qualified Health Centers (FQHCs) (People, 2012).

Vision Screenings and Testing

It is difficult for children to complain about eye problems, as they may not be aware that the way they see is different from any other person. Vision screenings and comprehensive eye exams can detect eye problems before they become serious. However, there is a definite lack of access to vision screenings and testing. Currently, about 40 states have mandatory vision screening in schools, and five others have or allow mandatory eye exams for children.

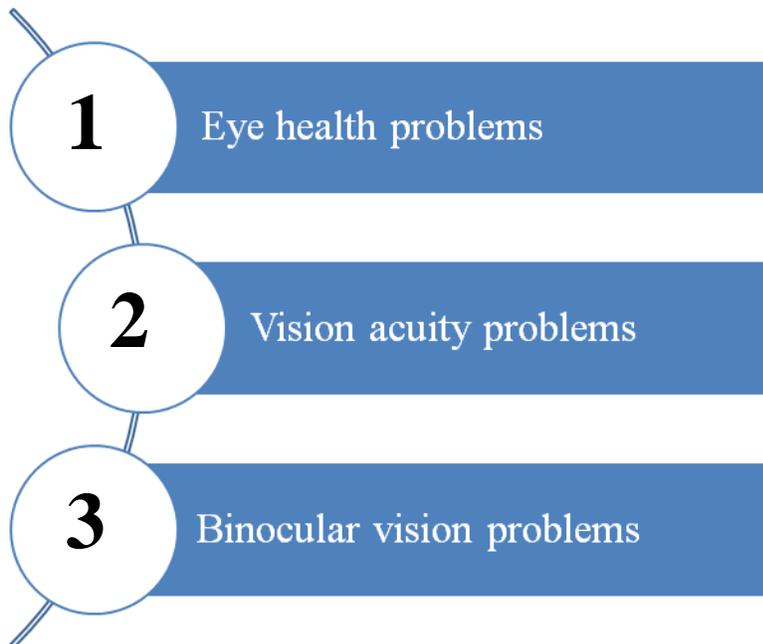
The 2002 Centers for Disease Control and Prevent (CDC) Report stated that for children under the age of six, only 36% had received a vision test (CDC, 2005). This has improved in recent years, as a study of 2006-2007 data of children who had vision screenings from doctors found that 79.4% of six-year-olds had received a vision test at some point (Kemper, Wallace, Patel, & Crews, 2011). However, this high rate reflects those who have only had one test in their lifetime as well as those having the biannual vision exams recommended by the American Optometry Association.

The quality of this vision screening is difficult to determine, as children may be screened through different trained entities such as schools, Head Start programs, pediatricians, other primary care health providers, or through eye professionals such as optometrists or ophthalmologists. A recent study of vision screenings done

by primary care providers showed that vision screenings by primary care providers can be improved through continuing education about vision issues and more standardized tests (Marsh-Tootle, Funkhouser, Frazier, Crenshaw, & Wall, 2010). Other studies have also showed a need for an improvement in standards of vision screening in order to ensure all children can be tested and follow-up care can be made with appropriate eye professionals (Kemper, Helfrich, Talbot, Patel, & Crews, 2011). However, because of the inadequacy of current vision screening standards (which limits the effectiveness of such tests); it is important especially for high-risk children to have regular eye exams with an eye professional to monitor development and catch vision problems early.

Potential Problems in Children's Vision

Three Types of Eye Problems



1) Eye Health Problems: Eye health problems can include infections, allergies, injuries, or diseases. It is important to catch these issues early because if they are not treated, they can lead to severe vision loss or even blindness. Both optometrists and ophthalmologists check for eye health issues. Eye health issues are usually treatable with medication or surgery. Eye health issues can also be present with other chronic conditions, like diabetes. It is important for parents to make sure their children get regular eye exams, especially when they may have chronic conditions that can affect the health of the eyes.

2) Vision acuity problems: Vision acuity problems refer to any issue with seeing clearly, either close-up or at a distance. These issues are usually correctable with glasses and include refractive errors as well as other acuity disorders. It is important to be aware of the signs of a vision problem in children. Young children may not know they have a vision problem, but may exhibit signs of having difficulty seeing, such as being clumsy, sitting close to the TV, or rubbing their eyes excessively (American Optometry Association, 2012). Children exhibiting any of these signs of a vision problem should be seen by an optometrist. If a child has a vision acuity problem, it is important to catch it early so it can be corrected before it gets worse.

3) Binocular vision problems: Vision is more than just being able to see clearly. In order to fully process all the visual input we receive, it is important for the eyes to work together well and communicate effectively with the brain. In order to do these tasks well, a child needs to be able to focus the eyes, use them both together as a team, and move them effectively (College of Optometrists of Vision Development). Any problem that prevents the eyes from fully functioning during these tasks is called a binocular vision problem (Zaba, The Social, Emotional, and Educational Consequences of Undetected Children's Vision Problems, 2001). The treatment for most binocular vision problems is vision therapy. Vision therapy is similar to physical therapy, but for the eyes. It is a series of exercises that train the eyes to work together effectively and communicate with the brain (Ciuffreda, 2002). Vision therapy supervised by trained doctors and carried out in their offices has been shown to be effective for the treatment of convergence insufficiency in both children (Scheiman et al, 2008) and young adults (Scheiman, 2005).

Additional research is being conducted to provide empirical evidence for the efficacy of office based vision therapy for other binocular dysfunctions.

The signs of binocular disorders in children can be similar to those for acuity disorders, but also include dislike of 3-D movies, poor coordination, and sensitivity to light. A noticeable eye turn is also a definite sign of a vision problem. It is important to catch binocular vision problems as soon as possible, so it is important to take children to an optometrist who checks for binocular vision problems (College of Optometrists in Vision Development, 2012). The inability of the eyes to work together well can have huge impacts on a child's ability to read.

Vision and Reading

Reading requires more than just looking at letters and recognizing them as words. There are three main tasks related to vision that must be mastered in order to be an effective reader. First, we need to aim two eyes at the same point simultaneously and accurately. Second, we must focus both eyes to make the reading material clear and sustain that focus. Finally, we must move our eyes continually as a coordinated team across the line of print.

If a child has trouble with any of these tasks, reading will be a chore. To look at a point close to us our eyes must point inward, called converging. Many children have difficulty converging their eyes enough to see one image on the page and instead see double. The inability to do this first task is called convergence insufficiency. If a child has trouble changing or sustaining focus it is called accommodative insufficiency. If a child has trouble moving their eyes, they may have an eye movement disorder (College of Optometrists in Vision Development, 2012).

There are a variety of different problems that can occur with a child's eyes that may prevent them from seeing well. An estimated 80% of what we learn comes through the visual processing system (Zeki, 1993). Without the ability to effectively process this information, a child will not be able to learn well. It is important for children to receive regular eye exams in order to ensure the health of their eyes, their ability to see, and the ability for the eyes to work together effectively.

How Parents Can Help

It is important for parents to be advocates for their children's vision. The American Optometric Association suggests that babies receive their first eye exam at the age of six months. At this exam, the doctor will test for excessive or unequal amounts of nearsightedness, farsightedness, or astigmatism, eye movement ability, and eye health problems. (American Optometry Association, 2012). The AOA also recommends that children receive eye exams at the age of three, before starting kindergarten, and every two years thereafter (All About Vision, 2012). High risk children, such as children who were premature or had low birth weight, were exposed to alcohol or drugs in utero, or were neglected in early life should be checked every year (Mozlin R. , 2001).

It is important for parents to be aware of the signs of a potential vision problem as well as the different kinds of vision problems that may occur in their children. Parents should make an appointment with a doctor if they notice excessive tearing, red or encrusted eyelids, constant eye turning, and extreme sensitivity to light, or appearance of a white pupil in their children. Parents should also be aware of behaviors that may indicate a vision problem in their children. These may include sitting close to the TV, holding a book too close, squinting, tilting their head, rubbing their eyes, having a short attention span, having difficulty with sports such as throwing and catching, sensitivity to light (especially fluorescent light or light from computer screens), and avoiding close work activities such as coloring or doing puzzles (American Optometry Association, 2012). Dislike of 3-D movies may also be a sign of a vision problem because the eyes need to be aligned properly in order to realize the full effect of the 3-D movie.

Signs of vision problems

- Excessive tearing
- Red or encrusted eyelids
- Constant eye turning
- Extreme sensitivity to light
- Appearance of a white pupil
- Dislike of 3D movies

Vision Problems and Academic Performance

Consequences of Having Vision Problems

Undiagnosed vision problems can cause more than just problems seeing and have far-reaching effects that incur great costs to individuals and organizations. If a child has a vision problem, such as difficulty sustaining focus or difficulty performing controlled eye movements, s/he will most likely struggle with reading and performing other close work. Varieties of studies have shown a link between underdeveloped reading skills and vision problems (Powers, Grisham, & Riles, Saccadic Tracking Skills of Poor Readers in High School, 2008; Grisham, Powers, & Riles, 2007). There are considerable savings possible both for the individual and for the school if vision problems are detected early and treated appropriately (New Jersey Commission on Business Efficiency of the Public Schools on the topic of Special Education Reform, 2006).

If a child has difficulty seeing, s/he will have difficulty with schoolwork. If a child has difficulty with schoolwork, s/he will not perform well in school. A 2006 study found that the number of vision symptoms reported in school age children was inversely proportional to academic performance (Vaughn, Maples, & Hoenes, 2006). This means that the more symptoms a child reported, the less likely s/he was to succeed in school. Limited saccadic movement (eyes moving together rapidly), convergence insufficiency, and accommodative insufficiency have all been linked to poor reading skills and slow reading speed (Grisham, Powers, & Riles, 2007; Powers, Grisham, & Riles, Saccadic Tracking Skills of Poor Readers in High School, 2008; Powers, Miner, Morita, & Tyler, 2010). A 2007 study in California showed that a majority of students in high school who read two grade levels or more below the expected level have underdeveloped visual skills. The study suggests that if these students' visual skills were developed, their level of reading would improve (Grisham, Powers, & Riles, 2007). In the last few years, there have been numerous studies linking low academic performance with vision problems.

Visual factors have also been found to be better predictors of academic performance than other factors such as race and socioeconomic status. A 2003 study found that visual factors such as visual motor integration and eye movement ability could predict 35% of the variance in scores on a standardized test. This is significantly higher than the predictive power of other factors such as socioeconomic status, which could only account for less than 5% of the variance in the data. Race could also only account for less than 5% of the variance in the data (Maples, Visual Factors that Significantly Impact Academic Performance, 2003). These results suggest that vision problems are a significant factor preventing students from succeeding in school.

The Importance of Early Detection and Treatment

The key to preventing vision related learning problems is early detection and treatment. If a child's vision problems are detected early enough, they can be treated before ever affecting learning and behavior. This objective has been identified as crucial to good vision health by various vision organizations. The main goal of Healthy People 2020, a science-based set of objectives that guides U.S. Health Policy, is to "improve the visual health of the Nation through prevention, early detection, timely treatment, and rehabilitation." A research study by Kodjebacheva and colleagues in 2011 called for adequate treatment for refractive errors in first grade students because the first grade is a period of critical academic development. Without adequate detection for vision problems, children cannot be expected to learn effectively (Kodjebacheva, Brown, Estrada, Yu, & Coleman, 2011).

If vision problems continue to be untreated they can have even larger effects than negative performance in school. A child who continually struggles to complete homework is more likely to give up or act out in school. A 2008 study by Bleything and Landis showed that 46% of students enrolled in an educational program for high school dropouts had some sort of undetected vision problem (Bleything & Landis, 2008). A 1999 study by Johnson and Zaba found that 74% of juvenile offenders failed at least one vision test (Johnson & Zaba, 1999). These results suggest that vision problems could be a contributing factor to high school dropouts and juvenile delinquency.

The Possible Link Between Vision Problems and ADHD

There is also a link between vision problems and attention deficit hyperactivity disorder (ADHD). Some of the signs of ADHD, such as hyperactivity and short attention span, can also be signs of a vision problem. For a full chart of how the symptoms overlap, see figure 1. A 2005 study by Granet and colleagues found that in patients diagnosed with convergence insufficiency, 15.8% also had ADHD (Granet, Gomi, Ventura, & Miller-Scholte, 2005). This is significantly higher than the prevalence of ADHD in the general population, which is 1.8-3.3% (Leslie, 2004). These results suggest that some patients who are diagnosed with ADHD may also have convergence insufficiency (CI). In patients diagnosed with ADHD, it is important to also evaluate them for convergence insufficiency so the CI can be treated and some symptoms may be reduced.

Symptoms	ATTENTION-DEFICIT/HYPERACTIVITY DISORDER Alternative Diagnoses				
	AD(H)D (DSM-IV)	Sensory Integration Dysfunction (Kranowitz, OEP)	Learning- related Visual Problems (Berne, Getz)	Nutrition Allergies (Rapp, Sahky Zimmerman)	Normal Child Under 7 (Kranowitz)
Inattention (<i>At least 6 necessary</i>)	x	x	x	x	
Often fails to give close attention to details or makes careless mistakes					
Often has difficulty sustaining attention in tasks or play activities	x	x	x	x	x
Often does not listen when spoken to directly	x	x	x	x	
Often does not follow through on instructions or fails to finish work	x	x	x	x	x
Often has difficulty organizing tasks and activities	x	x	x	x	x
Often avoids, dislikes or is reluctant to engage in tasks requiring sustained mental effort	x	x	x	x	x
Often loses things	x	x	x	x	x
Often distracted by extraneous stimuli	x	x	x	x	x
Often forgetful in daily activities	x	x	x	x	
Hyperactivity and Impulsivity (<i>At least 6 necessary</i>)	x	x	x	x	x
Often fidgets with hands or feet or squirms in seat					
Often has difficulty remaining seated when required to do so	x	x	x	x	x
Often runs or climbs excessively	x	x		x	x
Often has difficulty playing quietly	x	x		x	
Often "on the go"	x	x		x	x
Often talks excessively	x	x	x	x	
Often blurts out answers to questions before they have been completed	x	x	x	x	
Often has difficulty awaiting turn	x	x	x	x	x
Often interrupts or intrudes on others			x	x	x

Figure 1: Symptoms of ADHD and Learning Related Visual Problems (Attention Deficits: A Developmental Approach. Optometric Extension Program 2003).

Call for Action

Researchers across the country are calling out for the need to address our country's vision problems before they hit epidemic proportions. In 2008, Dr. Joel Zaba published a paper calling for better detection and treatment of vision problems in children. In the paper, he links better vision care to increased literacy, which leads to fewer societal problems such as reduced incarceration rates. This in turn leads to a better economy because more people will be able to positively contribute to the workforce. The paper claims that with each 1% increase in literacy, there is a 2.5% increase in productivity and a 1.5% increase in GDP (Zaba, 2008). The Gemstone Foundation, a nonprofit in California, has found that 38% of children tested in the LA Unified School district have some sort of vision problem that prevents them from learning effectively. The Foundation is developing a computer program designed to help children overcome those issues and have a better chance at succeeding in school. Of the students who completed the computer program, 80% of them saw their reading scores improve at least one grade level in one semester (Gemstone Foundation, 2012).

Vision problems can negatively affect academic performance. Early detection and treatment of children's vision problems is essential in order to improve the lives of thousands of children struggling with reading and close work. In order to help our children succeed in school and avoid high school drop outs, juvenile delinquency, and wasteful spending, we need to be doing more to diagnose and treat children's vision problems.

Cost of Ignoring Vision Issues

The United States

Vision issues are prevalent in the United States today (Vitale, M.F.Cotch, & Sperduto, 2006). Vision problems are a leading cause of developmental disability among children (CDC, 1996) and can affect quality of life when left untreated (CDC, 2004). Even if services are available, some people find these services to be out of reach because of the expense associated with them (Kilmer, Bynum, &

Balamurugan, Access to and Use of Eye Care Services in Rural Arkansas, 2010). A 2002 study showed that only 36.3% of children had ever had their eyes tested and only 7.4% had gotten a comprehensive eye exam from an eye-care provider (MMWR, 2002). However, even with the low number of children tested, 2.5% reported visual impairment or blindness (MMWR, 2002). There are a high number of children who are not receiving the testing they need to allow appropriate eye care to be provided. When this happens, the costs associated with developmental disability and decreased quality of life can be astronomical.

A Look at New Jersey

A study in New Jersey measured the cost of not starting early learning reading programs for special education programs. Currently, the state spends over \$900 million per year on special education programs. If there was appropriate early learning reading assistance, there would be both a cost benefit and a benefit in the quality of life for children affected. The savings alone are estimated to be approximately \$200 million per year (New Jersey Commission on Business Efficiency of the Public Schools on the topic of Special Education Reform, 2006). This demonstrates the sort of cost savings that can occur when programs are targeted toward early development that can affect learning and development.

Individuals

Costs to individuals to access vision services can be prohibitive. These costs can be from a lack of vision insurance (Kilmer, Bynum, & Balamurugan, Access to and Use of Eye Care Services in Rural Arkansas, 2010), cost of services provided (Kilmer, Bynum, & Balamurugan, Access to and Use of Eye Care Services in Rural Arkansas, 2010), and the cost of transportation (Probst J. C., Laditka, Wang, & Johnson, 2007; Owsley, et al., 2006). Because of these barriers there are a number of studies that investigate cost-savings programs to provide screening, testing, and treatment services within schools and the community (Joish, Malone, & Miller, 2003). In addition, the literature suggests that incorporating vision services into existing social and health services can be a cost-saving way to provide access to these services for low-income communities (Proser & Shin, 2008; Primo S. A., et al., 2009).

Low-Income Children

The costs of ignoring the problem can be much higher than the costs of implementing prevention programs. There is research suggesting that the brunt of vision problems occurs within low-income children (Basch, 2011; Maples, A Comparison of Visual Abilities, Race, and Socioeconomic Factors as Predictors of Academic Achievement, 2001; Mozlin R. , 2001; Ethan & Basch, 2008). It is sometimes hard to get a reliable estimate of the number of low-income youth who have vision problems because the problems often go undiagnosed because of a lack of access to care (Basch, 2011). This trend is similar to access to other health services (Flores & Tomany-Korman, 2008). However, the link between low academic achievement and economic cost is one that is well documented in the literature. Vision impairment is also linked to juvenile delinquency (Harris, 1989), which is enormously costly for communities to treat. While it may not be that preventing vision problems from going untreated can prevent juvenile delinquency, this relationship needs further inquiry.

Populations with Co-Morbidities

Costs from untreated vision impairment can be high in populations with co-morbidities that also affect development. One example of this phenomenon is Fetal Alcohol Syndrome (FAS). FAS prevalence rates are estimated to be 9-10 cases per 1,000 live births (Lupton & Harwood, 2004). Many children born with FAS have vision problems in addition to other neurological, mental, and developmental disabilities (Lupton & Harwood, 2004). Many babies born with FAS exhibit an underdeveloped optic nerve, which can affect visual processing, and many clinically referred FAS patients have decreased vision acuity as well as other disorders such as strabismus and ptosis (Bruce, Dean, Newman, & Biousse, 2009; Lynch). Another condition that may be co-morbid with vision problems is Attention Deficit Hyperactivity Disorder (ADHD) (Leslie, 2004). Both conditions can be costly to treat effectively, so it is important that they are treated simultaneously. If only one condition is treated there may not be as significant an improvement as there would be if both are treated together.

What Can be Done

There are many costs associated with vision problems, especially untreated vision problems. One way to address this problem is by increasing testing and early diagnosis of vision problems. In addition, by adequately using existing resources to improve access to vision services, treatment may become more accessible and the costly problems that come from untreated vision problems may be greatly reduced.

Access to Vision Services

While there are high rates of vision problems in the United States and around the world, part of what makes this problem so insidious is that there is a high number of people with undiagnosed and untreated vision problems. When these problems go untreated, they can affect development, academic achievement, and quality of life for children. In addition, some vision problems can progress and cause low vision or even blindness. It is therefore important to examine the rates of access to vision services in addition to examining the rate of vision problems in a population to truly see the need for improved access to vision services.

Foster Children

Foster children have been documented to be “sicker” than the general population of children (Program, 2006). Because of the disruptions in their families that have lead to an out-of-home placement, they often can have behavioral and mental health problems. Combining this with vision problems can make it very difficult for a child to succeed.

A study from the 1980s highlights how children who have juvenile delinquency problems have higher rates than the general population of vision problems (Dowls, 1984). This study, as well as others, suggests that especially in high-risk populations, vision testing is imperative.

In addition, providing attention to health services for foster children can be complicated and confusing as they often move from place to place (Sobel & Healy, 2001). To effectively address vision problems in foster children, policies need to make sure this is a priority for foster families and case workers. Some states have

already included mandatory vision exams as part of what a child must have when they enter the foster system. Often, there are mandatory vision screenings included in pediatrician exams, but these vision screenings can be erratic and ineffective. Foster children need to have access to comprehensive vision exams.

Rural Communities

Like many other health services, vision services in rural communities are sometimes less accessible than in urban communities. A study found that people living in rural areas were more likely than urban residents to have to drive 30 miles or farther to access vision services (Probst J. C., Laditka, Wang, & Johnson, 2007). Another study of rural residents showed that eye care insurance coverage was significantly lower for rural adult residents, and rural residents were less likely to utilize health care services than urban residents (Kilmer, Bynum, & Balamurugan, Access to and Use of Eye Care Services in Rural Arkansas, 2010). A study of older African Americans showed that one of the primary barriers to access vision services was transportation problems (Owlsey, et al., 2006). In addition to overall high rates of rural lack of access, many Native Americans live in rural communities. Most reservations are in rural areas and the risk for undiagnosed vision problems that is seemingly related to their ethnic heritage may also be related to other factors, such as the rural availability of vision services. Further research needs to be done to determine the level of risk for rural youth, especially for foster children of color.

Native American Population

There have been numerous studies that have shown that Native Americans have higher rates of vision impairment than other ethnic groups (Harvey, Dobson, & Miller, 2006; Miller, Dobson, Harvey, & Sherrill, 2003; Lee, et al., 2005; Pensyl, Harrison, Simpson, & Waterbor, 1997). High rates of astigmatism have been noted among Native American children (Harvey, Dobson, & Miller, 2006; Miller, Dobson, Harvey, & Sherrill, 2003). Particularly in the Pacific Northwest, common adult vision problems include refractive error, glaucoma, and age-related vision problems (Mansberger, et al., 2005). Visual impairment has been linked to causing a decreased quality of life for Native Americans (McClure T. , Choi, Becker,

Cioffi, & SL, 2009), while treatment for refractive errors with eyeglasses has been shown to improve the quality of life of Native Americans in the Pacific Northwest (McClure T. M., et al., 2011).

Community Health Centers

There have been a number of studies examining the effects of different community-based, policy, and medical responses to the high level of undiagnosed vision problems. There is a call to standardize vision screenings (Kemper, Wallace, Patel, & Crews, 2011; Marsh-Tootle, Funkhouser, Frazier, Crenshaw, & Wall, 2010; Kemper, Helfrich, Talbot, Patel, & Crews, 2011) and to improve the quality of these screening tools. In addition, there are a number of other factors to consider. The importance of Community Health Centers to provide access to vision services especially for low income rural families is imperative. In addition, there is a need to follow up vision testing with access to treatment options and education of the public about the importance of vision health. Especially for foster children, access to vision services needs to be provided and provisions need to make sure that every child who needs vision services receives it.

Community Health Centers (CHCs) have been identified as an important route of access for low income populations. This is reflected in the Healthy People 2020 objective to improve access at Federally Qualified Health Centers (FQHCs). However, there are currently limitations as to what the CHCs can provide. Only about 20 percent of CHCs provide eye and vision services on site (Primo S. A., et al., 2009). The rest provide referrals. By increasing access to onsite vision services, CHCs would be able to address the lack of access for many people whose only health care option is a community health center. In addition, by making vision services available along with other health services, there is a greater chance to educate patients about the need for regular care. This could reduce future health care costs by providing a sort of preventive service--catching vision problems before they negatively affect development (Committee, Proser, & Shin, 2008). One problem with providing vision services at CHCs is that currently, funding for eye care is labeled as a “specialty service”. In addition, optometrists, along with other primary care “first contact” health professionals such as pharmacists and dentists, do not qualify for the National Health Service Corps, a scholarship program that allows primary care providers to repay school loans through service at CHCs. This

makes it financially difficult for them to work in low-income areas (Primo S. A., et al., 2009). This means that there is currently a lack of professionals who are able and willing to work for vision care at CHCs. In order for CHCs to provide better access to vision services, changes need to be made to the way eye health is viewed by those making funding decisions and policies.

Lack of Coverage

Once children or adults have vision tests, they need to be able to follow up with the needed treatments to address their vision problems. This can be a complicated process. Some places provide cheap or free basic glasses to low-income children, while some do not even take Medicaid or Medicare patients. In addition, if a child needs vision therapy, only treatment for certain diagnoses are covered by vision insurance. In addition, through the Indian Health Service, insurance claims for specialty services require numerous approvals and take quite a while to process. These barriers may be difficult for parents or members of the public not familiar with the health services systems in place. Treatment for vision problems is usually fairly straightforward, but the process of paying for these services can be long or just too expensive. Work also needs to be done to insure that all children receive access to the vision services they need.

The Need for Vision Education

Vision education is similar to other types of health education, in that it educates the public about the need for comprehensive vision services. This field is just emerging, but one pilot study last year proved effective at changing nutrition behaviors that affected eye health. (Starkey, 2011) In addition, there is a definite problem with promoting compliance with vision treatments, such as for children to wear their eyeglasses. While a study among Native American adults found that having eyeglasses improved their quality of life (McClure T. M., et al., 2011), it was found that even in California, where children have vision screenings before kindergarten, 95% of the children indicated to have decreased vision acuity still did not have eyeglasses. This was especially true for African American and Latino children, as opposed to white children (Kodjebacheva, Brown, Estrada, Yu, & Coleman, 2011). Another study of school children who had received eyeglasses one year previously showed that after only one year, two thirds of children were

not wearing their glasses. Two major reasons for this were cited as the eyeglasses being lost or broken (Messer, Michell, Twelker, Cresioni, & Group, 2012). There needs to be greater education for parents, caregivers, and educational professionals about the importance of vision care and the resources available to replace or fix eyeglasses. In addition, children need to be educated about the importance of taking care of their own vision.

In order to treat vision needs, more research needs to be done on which populations are at greatest risk for vision problems, and which populations do not have access to adequate vision services. Interventions such as the AmeriCorps Child Vision Project, has increased access to vision services for foster children, changes in policies, increased focus on vision problems at CHCs, and increased access to vision education are important ways to combat the issues as well.

Working Toward a Solution:

The AmeriCorps Child Vision Project

Goals

The AmeriCorps Child Vision Project, which utilizes AmeriCorps volunteers, was created in 2010 in the hope of addressing unmet vision needs among disadvantaged children in the Yakima Valley. The program works primarily to facilitate access to vision services for foster children from various foster care agencies in the Yakima Valley. The two main goals of the program are to increase access to vision services for foster children in the Yakima Valley and to increase awareness in the community about the importance of vision testing for children.

To address the first goal of the program, AmeriCorps volunteers obtain referrals from caseworkers for each child and contact the foster parents/guardians to help organize appointments for the children with developmental optometrists. If needed, volunteers also provide transportation for children to the initial appointments. Even if not providing transportation, the project follows up with the optometrists and families when a child needs follow-up care. The project also provides education and support to foster families for children needing glasses by scheduling follow-up

fittings, working with insurance companies to provide coverage, helping replace glasses if broken, and providing transportation to follow-up appointments. In addition, the project provides education and support to foster families for children needing vision therapy by scheduling follow up assessments, scheduling vision therapy sessions, providing transportation (as needed) to follow-up appointments, working with insurance companies to provide coverage, and working with the children up to five times a week on at-home exercises.

First Year Activities

In the first year of the program, the AmeriCorps member Dan Fleishman helped 46 foster children receive comprehensive vision exams by optometrists in the Yakima Valley. Of the 46 children examined, 43.5% of them had some kind of undiagnosed vision problem that required treatment. Treatment could include a new glasses prescription, medication for allergies, or vision therapy for a binocular vision problem. Three children were enrolled in vision therapy and two of the children completed the program successfully. Of the 46 children examined, 100% had either hyperopia, astigmatism, or some other condition that will need to be monitored as they grow.

Second Year Activities

In the second year of the program, AmeriCorps members Kara Bensley and Sienna Laughton helped 54 foster children receive comprehensive vision exams. Of the 54 children examined, 44% of them had some kind of undiagnosed vision problem that required treatment. Of the children tested, 69.7% of them required either treatment or monitoring. Six children were enrolled in vision therapy and all have shown improvement. The percentage of children requiring treatment is similar between the first and second years of the project. Combining the data from both years of the project, 59.6% of school-aged children required some form of treatment.

Summary of the First Two Years

The prevalence of undetected vision problems found during the first two years of the Child Vision Project is comparable to other published studies of a similar nature. A 2000 study in New York City found that 44.4% of children required some form of treatment (Festinger & Duckman, 2000). The percent of children with undetected vision problems is also similar between the first and second years of the Child Vision Project. For a graph of how the data from the NYC study compares with data from the Child Vision Project see Figure 2. The fact that the data from the Child Vision Project is similar to other studies in the literature and similar between the first and second years of the project is a testament to the validity of the program.

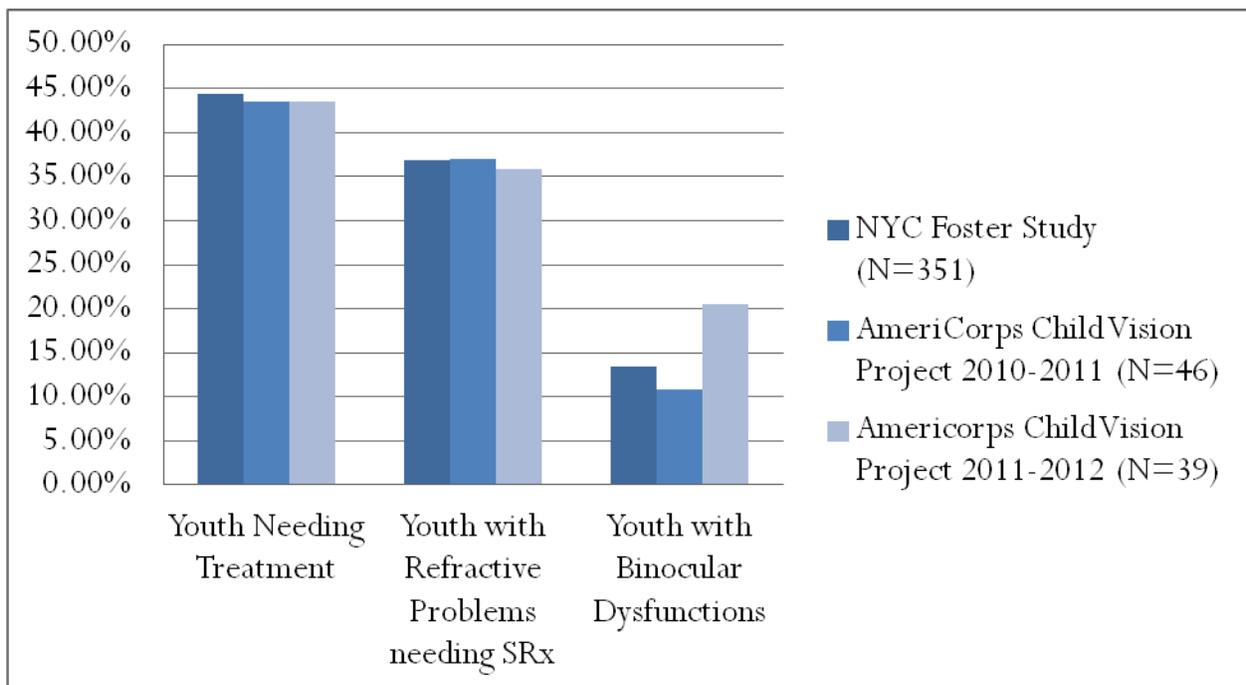


Figure 2: Percent of youth needing treatment from the NYC Foster Study, the AmeriCorps Child Vision Project 2010, and the AmeriCorps Child Vision Project 2011.

Community Education

To address the second goal of the Washington Child Vision Program, the project has hosted four trainings for the community about various issues surrounding children's vision including the link between education and vision, visual stress, and

binocular dysfunctions. Optometrists Dr. Ben Winters, Dr. Thomas Copeland, Dr. Cory Manley, and Dr. Kristi Kading gave presentations as well as AmeriCorps volunteers Dan Fleishman, Kara Bensley, and Sienna Laughton. Volunteers Kara Bensley and Sienna Laughton have also presented at the Yakima Lion's Club, multiple Yakima WIC agencies, the Yakima Valley Farm Worker's Clinic, the Washington State Indian Education Conference, and had booths at health fairs in Toppenish, Mabton, Granger, Wapato and Zillah.

Success Stories

The Child Vision Project has made a positive impact on the lives of many children in the Yakima Valley. Great-grandmother Marie Miller has praised the Child Vision Project for identifying severe astigmatism in her great-grandson. Her great-grandson has been wearing glasses for the past year and hopefully will not have to wear them for much longer. Marie Miller has grandchildren whose astigmatism was not caught as early her great-grandson's was, and they still require strong prescription lenses as adults. Thanks to the Child Vision Project Marie's great-grandson may not have to wear glasses for his entire life.

Maggie Wagner, a foster parent in the Yakima Valley, has also seen first-hand the positive effects of adequate vision care. One of her sons was unable to ride a bike at the age of 8, but after two months of vision therapy finally could ride with ease. Vision therapy consists of a series of exercises designed to train the eyes to work together and communicate better with the brain. Before vision therapy, his eyes were too uncoordinated for him to balance on a bicycle. Now his eyes work together effectively so he is less clumsy, more coordinated, and able to ride a bicycle. He also can read more easily, without covering one eye. It is important for all children to have good vision skills, so that their eyes work together to read comfortably and their school work is not hampered by vision dysfunctions. Another child in vision therapy through the Child Vision Project achieved a jump in reading level of three-quarters of a grade level after 4 months in vision therapy.

Next Steps

During 2012-2013, two new AmeriCorps members will replicate efforts to improve access to vision services for foster children in Pasco. The project will also focus on community outreach, especially to local schools and the migrant community.

Additionally, a Masters in Public Health Candidate in the Community-Oriented Public Health Practice Program at the University of Washington will be continuing efforts in the Yakima Valley for her capstone project. The focus of the capstone will be proposing strategies to reach the special education population. Deliverables will be a research report that will serve as foundation for funding opportunities to conduct comprehensive vision screenings, and health education materials.

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