WHAT IS THE EFFECT OF IMPLEMENTING AN ADAPTED STANDARDIZED VISION SCREENING PROCESS ON THE OUTCOME OF PATIENT RATE OF COMPLETION? A PILOT STUDY FOCUSED ON AN UNDERSERVED SPANISH SPEAKING POPULATION OF CHILDREN AGED 5 – 17.

by

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University of Pittsburgh, 2017

The purpose of this research study was to address the association between lower socioeconomic status and pediatric eye conditions as it relates to the lack of standardized screening processes. In the United States, there are no national standards to guide or even require that vision screenings are done adequately and utilizing evidence based instruments. Studies have determined that the lack of standardization is a contributing factor to the low rate of screening in school age children. A gap in knowledge exists within the needs of Spanish speaking children and their families, due to the lack of standardization as well as the numerous disparities facing this specific population.

A new adapted standardized screening process was implemented at the *Salud Para Niños* clinic (Health For the Children). This program provides low-cost (sometimes free) primary care and culturally competent community outreach to Spanish and Portuguese speaking children and their families in southwestern PA. *Salud Para Niños* free clinic program makes use of existing clinical space and depends on donated resources and volunteers; therefore, it is faced with even more obstacles when trying to implement changes in practice. The rate of completion of the old

non-standardized screening tool (kindergarten chart), was compared to the new standardized tool (LEA symbol chart). A hand chart was also used to address any language barrier.

Eighteen children between the ages of 5 and 17 were asked to attempt both screenings in a randomized order. The primary outcome variable in this study was the completion of the old examination process versus the new examination process. Time to complete the examination, if applicable, was also measured and analyzed to determine clinical efficiency. Our results indicate that a standardized screening tool, such as the LEA symbol chart, is effective at producing more reliable measurements in Spanish speaking children in a shorter period of time. The Center for Children's Vision and Eye Health recognize this as an evidence – based tool for children who speak English. These results support the idea that this tool can improve quality of vision screenings in primary care settings for populations facing a language barrier.

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1.0 INTRODUCTION

Healthy People 2020 and the U.S. Preventative Task Force have recognized vision screening for all youth as a significant public health priority in the United States for many years (Ressel, 2003). They have partnered with numerous national agencies to implement standardized practice guidelines and policies to address existing disparities to providing this vision care. Currently in the United States, there are no national standards for vision screenings. Each state respectively has the power to determine the practice guidelines implemented within schools and physician offices. Due to the inconsistency between states, as well as the lack of standardization and evidence – based screening processes, a gap in preventative care exists. Studies have determined that the current low rate of preschool vision screening in primary care practices may be attributed to inconsistent screening recommendations and insufficient implementation of selected tests (Hered & Rothstein, 2003). This problem is particularly evident in children and adolescents of low socioeconomic status and those with a language barrier. Therefore, it is important to recognize the need for equitable care for all children as it relates to vision screening to increase their psychosocial well-being and give them optimal opportunities for success (Ramsey, Jean MD, 2015).

A 2011 National Survey of Children's Health conducted by the Data Resource Center for Child and Adolescent Health (DRC) found that only 58% of children who were below the federal poverty level were screened for visual deficits at least once before the age of 17. Those that

were uninsured at the time of the survey also demonstrated a lower screening rate of 58%, and of Hispanic children whose primary household language was Spanish, 48% had only been screened once before the age of 17 (Child and Adolescent Health Measurement Initiative, 2016). These statistics depict the disparities that exist in equitable care across all populations and highlight the need to address common barriers within underserved populations. The United States Preventive Services Task Force (USPSTF) recommends instrument-based vision screening, with "B" level evidence rating, for all children at least once between the ages of 3 and 5 years (Donahue, Arnold, Bradford, Epley, & Peterseim, 2016). In evidenced based instrumentation, "B" level evidence means that it is highly recommended and that this screening intervention should be implemented into practice since it has shown to detect potential vision problems. Another study conducted by Hered & Rothstein found that fewer than 25% of U.S. preschool children had undergone vision screenings by either private or government programs (2003). They attribute this statistic to inconsistent screening recommendations, insufficient guidance on implementation of tests, and several frequent patient barriers that effect the integration of screening tools in primary care settings.

There is an important difference to note between vision screenings and comprehensive eye exams. Vision screenings are used to determine the need for a person to follow up with an ophthalmologist for a comprehensive eye exam, where they are further assessed for a variety of conditions. Therefore, vision screenings should be completed in schools and primary care settings on a regular basis to identify vision problems early on and begin the referral process. Over 20% of school-age children have some form of an ocular conditions. The World Health Organization (WHO) estimates that 7 million children between the ages of five and 15 years old are affected by non-refractive disease, meaning that it is linked to a disease process more

complex than just near or farsightedness (Hark et al., 2016). Access to regular vision screenings can find that the child may need a more comprehensive exam to prevent long term effects. A child should obtain a vision screening on a regular basis either at school or in a primary care setting at least once a year (Ressel, 2003).

A study funded by the National Eye Institute (NEI), part of the National Institutes of Health found, "that uncorrected farsightedness (hyperopia) in preschool children is associated with significantly worse performance on a test of early literacy"(Kulp, MT, 2016). Long term effects of lack of optimal standardized vision screenings can lead to decreased psychosocial well-being of a child or adolescent. "One of the challenges to the investigation of a causal relationship between vision and literacy is the potential confounding effect of socioeconomic factors. It is well known that socioeconomic deprivation is associated with poor levels of literacy" (Bruce, Fairley, Chambers, Wright, & Sheldon, 2016). However, it is still of equal importance to ensure that all children of every background are given the same opportunity to achieve in school. Regular vision screenings utilizing an established standardized process may alleviate additional barriers related to a child's education. A 2016 study entitled "Parent, Teacher, and Student Perspectives on How Corrective Lenses Improve Child Wellbeing and School Function" found that stress and poor school performance are two of the most prevalent experiences related to vision problems by children of all ages and their families (Dudovitz, Izadpanah, Chung, & Slusser, 2016). This influences the psychosocial well-being of school age children and is highly impactful on their future if they cannot see the board in their classroom or read text without straining.

A search of the database PUBMED offered numerous results supporting the need for improvement in pediatric vision screenings, especially in primary care centers. Because there is

no national standard for pediatric vision screening, many studies analyzed the number of practices that do and do not adhere to the American Academy of Pediatrics (AAP) recommended guidelines. The policy statement released by the AAP in 2003 stressed the importance of early screening and detection of vision problems in children, as a child will not typically voice problems with their vision. The AAP included a table of guidelines for screening children between the age of three and five years; however, while this attempted to standardize the process, no recommendations for implementation were included for the future (Ressel, 2003). Equally, no states even reference specific evidence – based guidelines such as these in their individual policies. During these studies, researchers also discovered that this was a highly evident problem affecting low – income families. Analyzing and understanding why this is the case can help establish a more effective intervention that considers all the barriers faced by these patients. This process will provide better care, and result in positive changes in practice. The overall consistency of the findings from these studies is further discussed below.

In 2006, Kemper & Clark conducted a study on preschool vision screening in pediatric practices, with the objective of identifying the barriers to this process and the impact of new technology and economic incentives on practice. The study identified the three broad categories related to barriers in vision screenings as practice related, test related, and referral related (2006). For adequate implementation of a reliable vision screening process to occur, every single one of these barriers need to be addressed. To determine the efficacy of pediatric vision screenings in primary care practice, Hered and Wood's 2013 study discovered many of the same barriers that were addressed in prior studies; however, their results also concluded that over half of the patients referred for further ophthalmologic examination after failing initial testing did not follow-up. This was especially apparent in patients from minority populations and low-income

families (Hered & Wood, 2013). The results of these studies are all encompassing of the hundreds of similar studies reporting the same problems with the pediatric vision screenings in the United States. Since there is no national standard for vision screening for all youth, effort should be made to implement the most scientifically – based guidelines currently available.

1.1 PURPOSE

A 2016 study published in the British Journal of Ophthalmology stated, "A number of studies have described an association between lower socioeconomic status and the incidence of pediatric eye conditions including refractive error, strabismus, and amblyopia" (O'Colmain, Low, Gilmour, & MacEwen, 2016). Therefore, a need exists for the availability of affordable preventative health care to be provided for this specific patient population. Additionally, extra resources are required to offer them the opportunity to establish better lives within the community. Such resources include a place where they feel safe to seek healthcare delivery, translators for accurate communication, and economic assistance to meet basic living needs. This would allow for their health to become more of a priority in their everyday life.

While a large portion of existing studies focus on early screening and barriers related to low socioeconomic backgrounds, a gap in knowledge exists within the needs of specific ethnic groups. This necessitates a more thorough examination on how a standardized process can be implemented in an adapted manner to address all the needs of a specific patient population. According to the 2010 U.S. Census, approximately 30,000 Hispanics or Latinos live in Southwestern Pennsylvania ("United States Census 2010," n.d.). A large portion of this population will face economic hardships due to language barriers, citizenship status, and

acculturation. When considering the large proportion of Spanish speaking children in need of preventative health care in western Pennsylvania, the focus will not only include early screening and common barriers, but the reality that most of these children and adolescents will be receiving their first vision screening.

In order to address the very evident health disparities plaguing underserved populations, specifically in Pittsburgh, PA, Dr. Diego Chaves-Gnecco established *Salud Para Niños (Health For the Children)*. This program provides low-cost (sometimes free) primary care and culturally competent community outreach to Spanish and Portuguese speaking children and their families in southwestern PA. *Salud Para Niños* free clinic program makes use of existing clinical space and depends on donated resources and volunteers; therefore, it is faced with even more obstacles when trying to implement changes in practice. The care provided by this clinic is essential to the community and is the first of its kind in this area (AHRQ Innovation Exchange, 2009). Overall, the healthcare provided by this clinic makes a positive impact on the community by addressing many significant needs affecting this populations ability to engage in society.

With respect to vision screenings, the staff does try to screen every eligible child; however, a more reliable screening process could be introduced to provide better patient care to this population. *Salud Para Ninos'* vision screening program is predictably not standardized, and is even less effective because of the innumerous socioeconomic barriers the patient population face in terms of accessing quality healthcare. By implementing an adapted standardized vision screening process, and doing so in a cost-effective and sustainable manner, the clinic will be getting closer to providing the most optimal care possible.

1.2 SPECIFIC AIMS

This study aims to determine the efficacy of implementing an adapted standardized vision screening process on the rate of completion by the participant.

1.2.1 Primary Aims

I. Develop and implement an optimal standardized screening tool, and to increase the rate of accurate measurement.

II. Adapt the screening tool to be used in Spanish speaking children between the ages of 5-17.

1.2.2 Secondary Aims

I. Improve the flow through the clinic by decreasing time spent on the vision screening process.

II. Educate parents/guardians on the importance of regular vision screenings for at risk children and emphasize that the lack of vision screening may have numerous consequences related to psychosocial well-being.

2.0 METHODS

To address the lack of national standard and variation of screenings completed throughout various healthcare settings, a standardized process was implemented at *Salud Para Niños.* It followed the recommendations presented by the National Center for Children's Vision & Eye Health which follows AAP guidelines, and was further adapted for Spanish speaking children and their families (Ramsey, Jean MD, 2015). After much observation, research, and collaboration at the clinic, a sustainable and effective process was established with clinic coordinators. This study presents the results of implementing a standardized process into practice and the effect on patient care. The standardized process recommended by the AAP was adapted with permission to fit this specific patient population.

2.1 SAMPLE

Patients from the clinic were included in the study if they spoke Spanish primarily at home and were between the ages of five and seventeen. To gain a more well-rounded understanding of the differences in screening, the minimum age of five was determined to be optimal for this study. Selection for participation of subjects five years or older allowed for increased opportunity for cooperation with the screening. A study entitled *Preschool Vision Screening in Pediatric Practices* noted, "the children's [ages 3 & 4] lack of cooperation with testing was the major

barrier (49%)" (Kemper & Clark, 2006). Screening younger children is more time consuming and more challenging. While this is an important aspect to address, this study is intended to provide a method for screening focused on language barriers rather than age. The goal number of participants was 20 children who spoke Spanish as their primary language at home and required that the vision screening process be completed in Spanish.

2.2 MATERIALS

Informed consent documents (See Appendix A) were provided in Spanish containing information regarding the intent, procedures, and risks and benefits of the study. It clearly stated that participation was completely voluntary and provided contact information for the investigators if needed. The old non-standardized chart (A) (See Appendix B) used for the vision screenings was the kindergarten chart, made up of various symbols, a large majority not easily identifiable by a young child. For example, this chart contains a sailboat, a cross, a flag, and a teacup. This chart is not recommended by any national agency as it does not accurately measure visual acuity because the symbols are not easily identifiable nor precisely printed to scale as they should be. The charts' history and developer are unknown. Unfortunately, it is still commonly utilized in many healthcare settings as it was one of the first types of pediatric screening tools to be made available (Ramsey, Jean MD, 2015).

The new standardized chart (B) (See Appendix C) is the LEA symbol chart which "contain[s] large examples of a house, apple, circle, and square" (Principles & Children, 2003). These symbols are more easily identifiable by a child and are culturally neutral. Meaning that one child may identify the symbol as a circle, while another may call it a ball. Both are correct,

thereby considering the various answers many children provide who have not had formal schooling yet. The LEA symbol chart also comes with a smaller hand chart that is comprised of one row of the symbols that can be used initially to familiarize the child with the symbols and determine how they identify them. This small hand chart can also be held by the child and they can point to and identify the appropriate symbol that is being referenced from the wall chart if they are shy or cannot speak. This can be especially beneficial in settings where a translator is not available and a language barrier is present, since the vision screening can essentially be done using limited communication. In addition, educational material (See Appendix D) in Spanish was provided to the guardians regarding the importance of regular vision screenings for children. It reviewed common symptoms that children may express if visual changes are occurring, as well as the repercussions that can occur if left untreated. Formal eye occluders were utilized to cover each eye for the exam. The use of an eye occluder or eye patch as recommended by the AAP is essential to obtaining accurate and reliable screening measurements (Ramsey, Jean MD, 2015).

2.3 DESIGN

This is an experimental descriptive study that was implemented using a randomized crossover methodological design. Each participant completed the old vision screening process as part of their clinic visit, as well as the newly adapted standardized process. The order in which the screenings were completed was randomized using a permuted block design. Data collected included whether the child completed the screening (yes or no) and the time it took to do so. The child's age and gender were also noted as secondary variables. For the purpose of this study, all subjects had to attempt completion of the screening processes using the kindergarten chart and

the LEA symbol chart. Completion of the screening is determined by the child's ability to identify the objects due to visual acuity rather than their inability to understand the chart itself. Typically, if a Spanish speaking child can read or identify letters appropriately, they may be screened using the Snellen chart. However, the Snellen chart also does not meet the international guidelines for appropriate optotype distance and are not all standardized. With the goal of the study being to adapt a standardized process to a Spanish speaking population, it is more effectively done with a culturally neutral chart such as the LEA symbol (Ramsey, Jean MD, 2015). There is no way to adjust communication methods using the Snellen chart if required due to a language barrier. The study added an additional five minutes to the visit.

2.4 PROCEDURE

Nursing students from a large urban research intensive university with a baccalaureate nursing program completed the screenings. Upon clinic arrival, the nursing students collected patient information including age, gender, and preferred language for communication. The students then completed an initial health assessment including collecting vital signs, height, weight, and vision screening given their respective age. At this point, it was determined whether the child does meet the inclusion criteria for the study. If inclusion criteria was met, verbal consent and assent was obtained from the guardian and child respectively after reviewing the consent form in Spanish. This was completed by the principle investigator and a third-party translator to ensure no undue influence occurred. Once this was completed, the child was randomly assigned to either group AB or BA, determining the order in which the vision screenings will the completed. Group AB received the old screening first then the new screening, conversely Group BA

received the new screening first and then the old screening. The nursing students were familiarized with the correct administration of the new screening process as it was outlined in a document that was kept on site at all times (See Appendix E). The children were then taught how to use the eye occluders by demonstration. If not capable of holding the eye occluder in place, another nursing student was available to hold it over the respective eye throughout the examination.

The old vision screening process had the child standing 20 feet away from the wall chart. While this is not incorrect for the Snellen and kindergarten chart, it is not the guideline for any other optotype screening chart (Ramsey, Jean MD, 2015). Having the child stand that far away in the small clinic space also lead to additional distractions and interruptions during the screening process causing additional stress. By moving the screening to 10 feet away, as recommended by the American Academy of Pediatrics, distractions and interruptions were decreased and it was much easier to communicate with the child in a noisy setting. The child was then instructed to cover the right eye first and once screening began the timer was started. The timer was not stopped when switching between eyes. The standard procedure is to have the child begin identifying the objects from the top line and move down. For the child to continue moving down the chart, they must get 50% of the line correct. The last line in which they achieve 50% correct is the final measurement. This process was repeated for the left eye.

The main difference between the old screening and the new screening is that the child is to identify the symbols preemptively using the hand chart provided to address any language barrier. Only the measurement from the old screening process was recorded in the medical record since it is necessary to first prove a positive change in practice prior to instituting a change in charted measurements. The specific measurements of the new screening process were

not recorded as part of the data collection because it was not relevant to the specific aims of the outcome variables. The procedure involves minimal risk to the subject as the probability of harm/discomfort anticipated in the new adapted standardized process is no greater than those encountered during the administration of the old vision screening process. The only identified risk factor is that the parent or child may become anxious due to the increased time of screening and unfamiliarity with the tool.

3.0 ANALYSIS

The primary outcome variable in this study was the completion of the old examination process versus the new examination process. Time to complete the examination, if applicable, was also measured and analyzed to determine clinical efficiency. Secondary variables that were analyzed included age, gender, and order effect. A McNemar's test, with a significance level of 0.05 was used for the stratified analysis of the primary variable due to the paired nominal data collected. Additional statistical measures such as Fisher's exact and paired t-test were calculated with a significance level of 0.05, to determine possible order, age, or gender effect on the outcome due to the smaller sample size (Hess et al., 2012).

3.1 RESULTS

Initial frequency data was calculated for the variables. A total of 18 participants made up the study sample, which is a sufficient number for the feasibility of a pilot study implemented in a single location (Leon, Davis, & Kraemer, 2011). The sample consisted of 6 (33.3%) females and 12 males (66.6%). The mean age of the participants was 10. 8 (± 4), with a range of exactly 5 to 17. For stratified analysis, the participants were divided into two age groups, ≤10 for elementary age and >10 for middle and high school. Seven participants (39%) fell into the younger age group, while 11 participants (62%) were in the older group. For chart A (the old screening tool)

8 participants could complete the screening (44%), while 10 participants could not complete the chart. All participants could complete chart B. Of those who completed the chart, the average time it took to complete chart A was 141.8 seconds (2 minutes and 21 seconds) ± 45.7 seconds. The range of time for chart A was 99 to 240 seconds (1 minute and 39 seconds to 4 minutes). The average time to complete chart B by all participants was 100. 7 seconds (1 minute and 40 seconds) ± 33.8 seconds. The range of time was 50 to 172 seconds (50 seconds to 2 minutes and 52 seconds). The screenings were completed in AB order by 11 participants, and BA order by 7 participants.

Table 1: Completion Rate

	Chart A	Chart B
Yes	8 (44%)	18 (100%)
No	10 (56%)	0 (0%)
Total	18	18

Table 2: Time

Chart A (Non – Standardized)	141.8 seconds (2 minutes and 21 seconds) ± 45.7 seconds
Chart B (Standardized)	100. 7 seconds (1 minute and 40 seconds) ± 33.8 seconds

The primary variable of completion of the old non – standardized examination process versus the new adapted standardized process was found to have a significant 2-sided p-value of 0.002 using the McNemar's test. This is demonstrative of the difference between the effective screening capabilities of the two charts. The amount of time it took participants to complete the two charts was statistically significantly different, with a p-value of 0.01. Meaning that the participants completed the vision screening process in less time utilizing the standardized chart compared to the non-standardized chart.

The secondary variables were analyzed for possible effects on the outcomes variables. Because every participant completed chart B, no secondary variable effect could be calculated related to the standardized screening tool. Therefore, the effect of secondary variables was only assessed on the data for chart A. For the non – standardized chart, four females and six males were unable to complete the chart, while two females and six males did complete the screening. A Fisher's exact p-value of 0.638 was calculated, determining that there was no association between gender and the ability of the participant to complete the vision screening process utilizing the old chart.

Age affect was explored for chart A by dividing the participants into the age groups listed above. For those ≤ 10 years of age, six of the eight participants in this group could not complete chart A, which generated a p-value of 0.031 using a McNemar's test. For the older participant group (> 10 years of age), a p-value of 0.125 was observed, with four of the ten participants within this group not completing chart. Overall, age effect was present with a significance of 0.02 for the old chart. This is significant in that the younger participants found it much more difficult to successfully be screened using the old chart.

Order effect was also a measure of interest, determining whether the order in which they

completed the different screenings had an impact on the primary outcome variable. For chart A, eleven participants completed the screenings in AB order, while the remaining seven were in the BA category. A 2-sided p-value of 0.066 was calculated, approaching statistical significance, in that a higher proportion of the participants that completed chart B first could then could not go on to complete chart A. However, for the participants who completed chart A first, the majority could go on to then complete chart B. This could be attributed to the higher difficulty level of the old screening tool in comparison to the new screening tool.

4.0 DISCUSSION

Our results indicate that a standardized screening tool, such as the LEA symbol chart, is effective at producing more reliable measurements in Spanish speaking children in a shorter period of time. Statistical analysis showed the LEA symbol chart produced results that are consistent with the findings of the numerous studies discussed previously in English speaking children, and why it is recommended by the American Academy of Pediatrics and supported by the National Center for Children's Vision and Eye Health (Ramsey, n.d.; Ressel, 2003). Although this is not a nationally recognized guideline, our results support the idea that this tool can improve quality of vision screenings in primary care settings. Our results emphasize that standardized screenings' overall efficacy may help to create a change in practice by re-enforcing the positive outcomes that proper screening can bring to a young child physically and psychosocially.

The adapted aspect of this new process that differs from any studies previously completed comes into importance with the specific patient population studied and the environment of *Salud Para Niños*. The hand chart offers the ability to conduct the screening in a match method rather than verbally. This is beneficial in the presence of a language barriers and was utilized in this specific way for this study, which proved to help with the completion rate of chart B. While this is less frequently used among English speaking children, every single Spanish speaking participant in this study used this to establish a baseline identity of the objects. By identifying the objects first, potential misunderstanding is reduced between the nursing

student and the patient given the language barrier (Clausen, Armitage, & Arnold, 2009). This procedure proved to very effective for the overall fluidity of the screening itself as well as the flow of patients through the clinic.

In a community clinic such as *Salud Para Niños,* demand for care is always very high while resources typically fall short. While health care providers never want their care to be rushed, an important factor related to being able to provide effective care for the large number of those in need is time. The fluidity of the clinic and how effectively it cares for patients plays a large role in the healthcare provided. Therefore, it is important to note that it took less time for the participants in the study to complete the standardized chart (LEA symbol) compared to the non-standardized chart (Kindergarten Chart). Increased time spent by a child on a screening can create more anxiety, lack of cooperation and fatigue (Kemper & Clark, 2006). Typically, vision screenings are done at the beginning of a visit as part of the nursing assessment. By using a screening tool that is not only easier for the patient to complete, but also reduces time spent is beneficial for both the patient and the flow of the clinic visit. The more efficient a clinic visit is, the more opportunity there is to see additional patients which is always a need within a clinic that provides free services.

Additionally, ensuring that the nursing students administering the exams are doing so in a reliable manner is imperative to positive outcomes. Every clinic day has a different group of students, therefore, having the standardized process in print and available for review is imperative to validity. The primary investigator also demonstrated the proper administration of the vision examination process to the students and a return demonstration was completed to ensure adequate understanding. The use of cost effective eye occluders that can be cleaned and reused between patients leads to long term benefits by ensuring proper examination, while also

lowering the financial burden on the limited resources of the clinic. By completing the screening at ten feet as recommended for the LEA symbol chart, interruptions are decreased and the children can focus on the task at hand. These are all simple changes that can make an impact on the ability to provide effective vision screenings. The implementation of a standardized vision screening process that is adapted to a specific population can be done while concurrently following evidence – based practice guidelines provided by organizations such as the AAP and National Center for Children's Vision & Eye Health. These guidelines have numerous studies supporting their efficacy, but have yet to be studied in all patient populations or implemented through policy.

Specifically, within the *Salud Para Niños* clinic, a change in practice could be implemented given the results of this study. The LEA symbol chart could be adopted as a new screening tool used for vision screenings. A study on a larger scale could also be completed to determine effectiveness of the adapted vision screening process in children who speak other foreign languages or have an intellectual disability. It would also be beneficial to further explore how to adapt this screening process to obtain better results in children three and four years old given that lack of cooperation has such an impact on measured outcomes.

Being that this was a pilot study; the sample cannot necessarily be generalizable to a larger population. However, the primary goal of the study was to determine an optimal screening process for a specific population in need. That is not to say that this cannot be replicated on a larger scale and potentially utilized in other healthcare settings that care for a similar patient population. The study data was also collected on a single day and utilized a convenience sample from the clinic, which limits the reliability measure.

While the implementation of a standardized process is beneficial to gathering accurate

measurements, many other barriers to care exist to improving overall preventative care. "Low primary care screening rates and inadequate rates of referral and completion of an ophthalmologic examination indicate that a different screening device will not in itself result in optimal detection and treatment of vision loss. Rather, improvements are needed in the entire process of preschool vision screening in the primary care setting, from screening to definitive diagnosis and, ultimately, to successful treatment" (Hered & Wood, 2013). This study begins to examine the needs of a unique patient population as it relates to pediatric vision screenings. It presents an evidence – based intervention that is a plausible option for improving the efficacy of vision screenings. Further studies examining proper referral and follow up needs is required to establish a comprehensive solution to the various additional barriers faced by this population to ensure adequate well-rounded care and improved psychosocial outcomes for children facing disparities in health care access.

APPENDIX A

INFORMED CONSENT DOCUMENT - ENGLISH

Consent to Act as a Participant in a Research Study

What is the effect of implementing an adapted standardized vision screening process on the outcomes of patient rate of completion?

Principal Investigator:
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You/your child can contact the study investigator if you have any questions about the study or should wish to withdraw. Contact Principal Investigator, Taylor Giambrone or the co-investigator, Dr. Diego Chaves – Gnecco at the phone numbers above. *If you/your child have questions about you/your child's rights as a research participant or wish to talk to someone outside the research team, please call the University of Pittsburgh Human Subjects Protection Advocate toll-free at 866-212-2668.*

1. **INTRODUCTION**:
    - This research is being done to find the best vision screening procedure for Spanish speaking children at the Birmingham Clinic. To help make vision screenings better, we ask that you/your child participate in this study. The participants are asked to complete two separate vision screenings. One is part of

the original medical visit, and the other is the study part.

- You/your child are being asked to participate in this study because you/your child are a Spanish speaking child between the ages of 5 and 17. We plan to enroll 20 participants into this study. This one time only participation will only add 5 minutes to your regular visit.

2. **RESEARCH ACTIVITIES**:
    - You/your child will be randomly assigned to one of two groups, either research study before regular visit, or regular visit before research study.
    - During the research study, you/your child will stand 10 feet from the chart and read the letters/objects per the procedure steps.
    - You/your child must attempt the original screening tool as part of your/your child's regular visit to the clinic, therefore, the completion of the study tool will only add 5 minutes to the medical visit.
    - Research results will not be included in your medical records.

3. **STUDY RISKS**:
    - There is minimal risk to you/your child in this study. You/Your child may experience anxiety because of the extra time required to complete the study portion of the visit. As with any study, there is always the possibility of a breach of confidentiality, which is rare.

4. **STUDY BENEFITS**:
    - No direct benefit will come from this study, but we hope to learn more about how to conduct vision screenings better in the future.

5. **YOUR PRIVACY AND CONFIDENTIALITY:**
    - You/Your child's personal information will remain confidential. Officials at the University of Pittsburgh may have access to research records. The data will be stored on a University of Pittsburgh secured computer and server within the school of nursing behind Pitt Firewall. The paper data will also be stored in a locked file cabinet, within a locked room in the school of nursing.
    - Your/your child's research data may be shared with investigators conducting similar research; however, this information will be shared in a de-identified manner (without identifiers). Research records will contain no identifiable information. You/Your child's research records will be maintained until the age of 23.

6. **STUDY PARTICIPATION**:
    - You/your child's participation in this research study is entirely voluntary. If there are any words you/your child do not understand, feel free to ask us. The

investigators will be available to answer your/your child's current and future questions.

- You/your child can withdraw from this research study at any time. If you choose to withdraw from the study, all data collected prior to the date of withdrawal will be utilized, unless you request to destroy it. Your decision to withdraw from this study will have no effect on your child's future care at the Birmingham Clinic or UPMC.

PARENTAL PERMISSION

Do you provide your permission for your child to participate in this research study?

CHILD ASSENT

Do you agree to participate in this research study?

IRB # PRO15110217

APPENDIX B

OLD (NON-STANDARDIZED) EXAMINATION CHART (A)

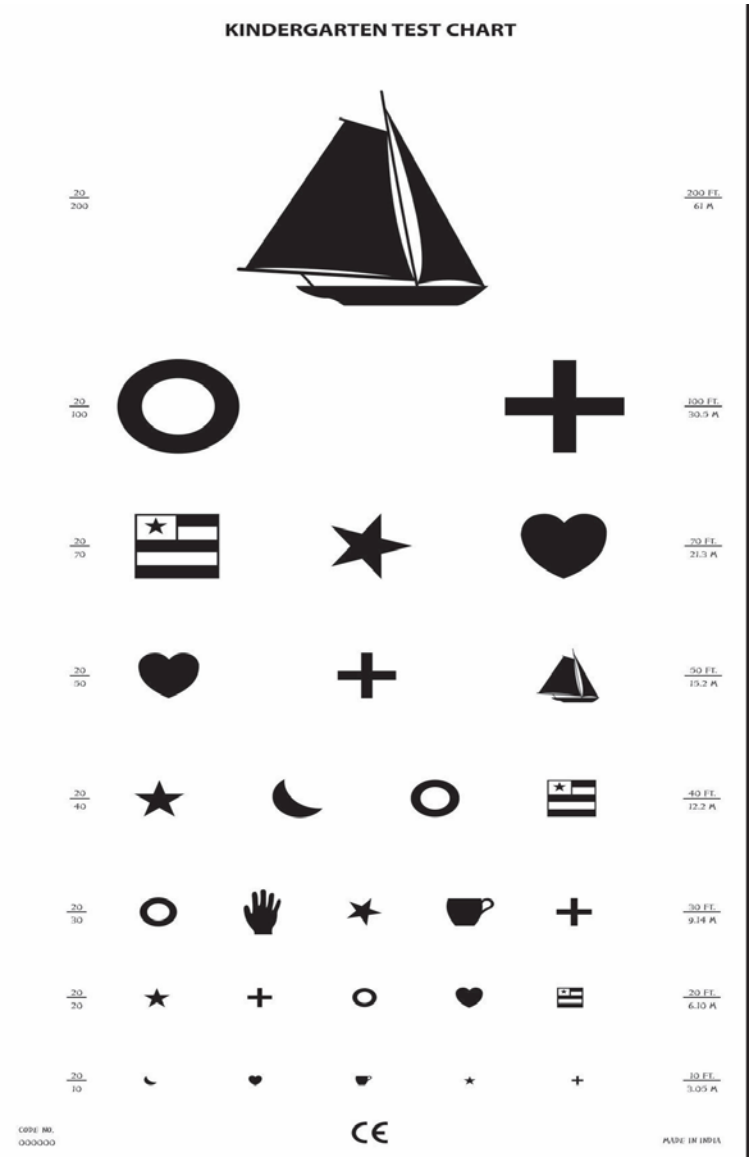


Figure 1: Non- Standardized (Kindergarten) Chart

APPENDIX C

NEW (STANDARDIZED) EXAMINATION CHART (B)

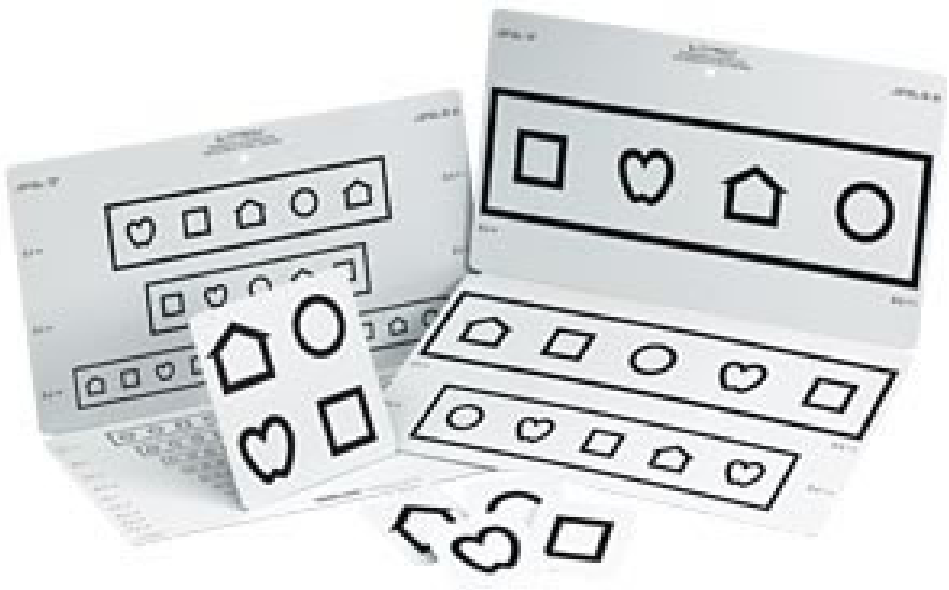


Figure 2: Standardized (LEA Symbol) Chart

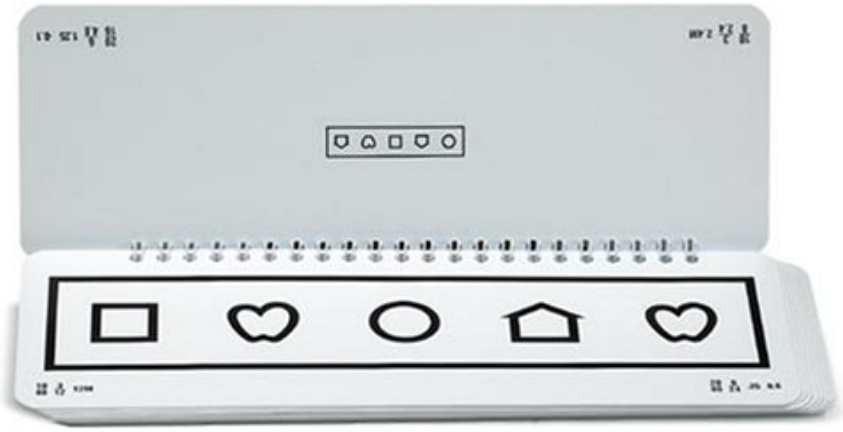


Figure 3: Hand Chart

APPENDIX D

EDUCATIONAL MATERIAL

¿QUIERE MÁS INFORMACIÓN?

EL EXAMEN DE LA VISTA ES LA CLAVE PARA EL DESARROLLO SALUDABLE!

PREGUNTE **si su hijo ha sido proyectados.**
HABLE **de los resultados.**
ACTUA **en las referencias.**

AYUDA ECONÓMICA PARA EL CUIDADO DE LOS OJOS:

preventblindness.org/vision-care-financial-assistance-information

nei.nih.gov/health/financialaid.asp

CENTRO NACIONAL PARA LA VISIÓNY LA SALUD OCULAR DE NIÑOS:

nationalcenter.preventblindness.org

CENTRO NACIONAL PARA IMPLEMENTACIÓN EN CASA DE SALUD:

medicalhomeinfo.org

AMERICAN ACADEMY OF PEDIATRICS-BRIGHT FUTURES INITIATIVE:

brightfutures.aap.org

PREVENT BLINDNESS AMERICA:

preventblindness.org

CENTRO NACIONAL DE DISEMINACIÓN DE INFORMACIÓN PARA NIÑOS CON DISCAPACIDADES:

nichcy.org/families-community/help/parentgroups

FAMILIA A FAMILIA CENTRO DE INFORMACIÓN DE LA SALUD:

fv-ncfpp.org/f2fhic/about_f2fhic/

¿TIENE MÁS PREGUNTAS?

Llame al **1.800.331.2020** o por correo electrónico **info@preventblindness.org**

NATIONAL CENTER FOR MEDICAL HOME IMPLEMENTATION
A cooperative agreement between the Maternal and Child Health Bureau/HRSA and the American Academy of Pediatrics

NATIONAL CENTER for Children's Vision & Eye Health
AT PREVENT BLINDNESS AMERICA

La salud visual es importante para las personas en todas las edades, pero especialmente para los niños.

Los niños utilizan su visión para aprender sobre su mundo. Es importante que los ojos de su hijo sean examinados durante las visitas de bien niño para asegurarse de que estén sanos.

No todos los problemas de visión se pueden ver.

Los niños que tienen un problema que no se dan cuenta o son capaces de describir un problema con su vista. Exámenes oculares regulares ayudarán a encontrar problemas posibles.

¡Trabaje con su hogar médico para mantener los ojos sanos del niño!

¿QUÉ ES UN "HOGAR MÉDICO?"

Un HOGAR MÉDICO es la clase de atención primaria de la salud que todos queremos y merecemos. El hogar médico no es un lugar–es la manera que el cuidado se proporciona a su hijo / y a su familia.

En el núcleo de un HOGAR MÉDICO es un médico bien informado y útil, y un equipo de atención elegido por su familia para cuidar las necesidades de salud de su hijo. El médico coordina la atención con especialistas (otros proveedores, como los oftalmólogos y la atención médica en el hogar, y los recursos de la comunidad.)

El HOGAR MÉDICO también crea un lugar central de confianza, donde la historia clínica de su hijo se completa.

UN MENSAJE ESPECIAL PARA LOS PADRES DE LOS NIÑOS NACIDOS PREMATURAMENTE (MENOS DE 32 SEMANAS COMPLETAS), Y LOS NIÑOS CON DISCAPACIDADES DE DESARROLLO , RETRASO O PROBLEMAS NEUROLÓGICOS:

Los niños nacen antes de tiempo, las personas con retrasos en su crecimiento, o con condiciones neurológicas están en mayor riesgo de problemas oculares. Estos niños deben visitar a un oftalmólogo regularmente para un examen ocular completo.

¡SEA UN PAREJA ACTIVA EN LA SALUD DE SU HIJO!

SABÍA USTED QUE ...

Generalmente, los niños no se quejan de problemas con su visión. Problemas en los ojos que no se corrigen pueden conducir a una pérdida permanente de la vista.

Lo que puede hacer:

1. Observe a su hijo, mientras que juega y mientras que mira libros, a mascotas y a otras personas. Si algo no se parece correcto, discuta este con el médico de su hijo.
2. Hable con su médico de cualquier historia familiar de problemas con la visión (como "ojo perezoso," un "ojo cruzado ", el uso de un parche en el ojo de niñez para corregir la visión, o la necesidad de anteojos con receta fuerte).
3. Pregunte en cada visita del niño si lo ojos y la visión se han comprobado.
4. Pregunte por los resultados del examen ocular y asegúrese de que entiende lo que significan.
5. El médico de su hijo puede recomendar que él / ella vea a un oftalmólogo para evaluar un problema encontrado durante la proyección. Si es así, asegúrese de hacer y mantener esa cita.
6. Después de la cita con el oftalmólogo, asegúrese de que todos los resultados se devuelvan de nuevo al médico de su hijo y se proporcione una copia a usted.

LOS SIGNOS DE UN PROBLEMA DE VISIÓN

Muchos problemas de visión en los niños no se pueden ver. Pero a veces hay signos de un problema ocular, como se muestra a continuación. Contacte al médico de su hijo si usted nota cualquiera de estos signos:

Estrabismo, a menudo llamada "ojo cruzado" o "bizquera."

Leucocoria, o una pupila que se ve blanca cuando la luz se refleja en el ojo.

Ptosis, o párpado caído que bloquea parte de lo que el ojo puede ver.

Las acciones que toma ahora le ayudarán a mantener a su hijo de una visión saludable. Asegúrese de:

INCLUYE

- ☑ Exámenes de la vista o evaluaciones de riesgo con la visión con cada bien chequeo del niño ANUAL.
- ☑ Investigue de todas las referencias para la visión.

MIRE Y DISCUTA

- ☑ Hable con el médico de su hijo sobre cualquier pregunta que tenga.
- ☑ Comparta inquietudes que usted u otros habrán dado cuenta de su hijo.

ANTES Y DESPUÉS DE UN EXAMEN OCULAR

- ☑ Mantenga la cita.
- ☑ Solicite el informe médico que se enviará al hogar médico de su hijo y obtenga una copia para usted también.
- ☑ Siga todos los tratamientos recomendados para la visión como lo indicó el oftalmólogo.
- ☑ Pregúntele a su oftalmólogo de cualquier ayuda o herramientas que el niño podría necesitar para la escuela y cómo obtenerlas.

PROTEJA

- ☑ Lleve gafas de sol que bloqueen el 100% de los rayos UVA y UVB del sol.
- ☑ Utilice el desgaste ocular correcto de la seguridad para actividades deportivas.

Avisa a atención el médico de su hijo si tiene cualquier problema encontrar o pagar por un examen ocular o el tratamiento.

Hay muchas organizaciones disponibles que pueden ayudar.

APPENDIX E

ADAPTED STANDARDIZED PROCESS

Vision Screening Process at *Salud Para Niños*: Birmingham Clinic

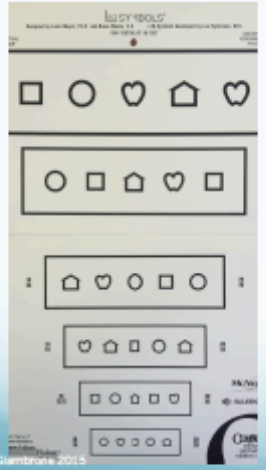
Taylor Giambrone
University of Pittsburgh School of Nursing

Importance

- Currently there is NO national standard for pediatric vision screening in the United States.
- This process is based on recommendations from The National Center for Children's Vision and Eye Health, Prevent Blindness Campaign.
- "fewer than 25% of preschool children in the United States have undergone vision screening by government or private programs"(Hered & Rothstein, 2003).

Type of Screening

- We will be utilizing threshold screening – move down the chart until child cannot correctly identify majority of optotypes.
- Optotype = name of picture, symbol, letter to identify.
- This type of screening measures solely visual acuity. This will not determine the presence of amblyopia or other conditions of the eye.



LEA Symbol Chart

- Used for children who cannot yet identify their letters.
- Begin screening at the top and move down according to their ability to identify the correct symbol.
- To pass a line, the patient must get at least 50% of the letters correct before moving on.
- The line to which they can accomplish this is the measurement to record.

- Remember to ask the patient or guardian if they have/wear glasses and note on vital sheet.
- Screen with glasses on if they brought them. If not, screen without and note they were not worn.
- Please **NO prompting** the patient to say the correct letter or figure. It is imperative we try to get the most accurate screening.
- A translator will always be available to help you communicate with non-English speaking patients and guardians if needed.
- If the patient is uncooperative, note on sheet that screening could not be completed and why.

Giambrone 2015

Procedure

- Direct the patient to stand at the 10 foot mark on the floor.
- Instruct them to hold the eye occluder up to cover one eye at a time.
- Ask them to identify the letter or object (depending on the chart used) as one student points to each and the other listens for the answer.
- Can ask parent/guardian if the patient knows their letters yet to determine appropriate chart, if unsure based on age.

Giambrone 2015

Procedure

- The LEA Symbol chart allows patients to identify optotypes as different things.
- For example, a circle can be a hula-hoop or a ball. A square can be referred to as an IPAD.
- If the patient is quiet or not speaking, you can offer them the chance to point at the figure they see on the small hand chart provided or draw on a piece of paper.
- Complete the screening for both eyes and record results.
- Clean eye occluders between patient use please.

Giambrone 2015

Thank you!

- I know your time is precious so I appreciate your efforts to learn and implement this screening process for the children in your care.
- Please ask questions!
- I sincerely hope you enjoy your time with the patients at the Birmingham Clinic this weekend!

- Ramsey, J. E. (n.d.). An educational webinar presented by the American Association for Pediatric Ophthalmology and Strabismus (AAPOS) as part of the Year of Children's Vision (YOCV) initiative.

Giambrone 2015

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