

Can You See Me? Primary Care Provider Education to Satisfy the Visually impaired.

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Abstract

Vision impairment has affected 2.2 billion people globally, with 12 million people affected in the United States; more than 700,000 Californians experience visual impairment or blindness (VI/B). Causes of VI/B can be prevented with early identification and intervention. This project aims to identify perspectives of the VI/B, use this insight to build and improve the knowledge/skills of the primary care provider (PCP). A quantitative study, utilizing the Theory of Interpersonal Relations alongside the Star Model of Knowledge Transformation, incorporated pre-intervention questionnaires for the VI/B and the intention of pre- and post-intervention questionnaire for the PCP. After consenting, the VI/B completed the Patient Satisfaction Questionnaire-18 ($\alpha = 0.87$) and Visual Functioning Questionnaire-25 ($\alpha = 0.95$) surveys via telephone. An interventional video discussing visual acuity and screening, legal blindness versus visually impaired, leading causes of blindness, common ophthalmic drops and their side effects, helpful hints, and resources for the visually impaired was created. Deidentified results were analyzed with descriptive analysis and Pearson correlation. Currently, 30 voluntary, consented VI/B members have completed the pre-surveys. The overall average patient satisfaction score was 46.73 with financial aspect and communication with the most positive evaluation. Unfortunately, their PCPs have not responded. The PCP questionnaire will be distributed to the ophthalmologist partner's healthcare organization. The needs of VI/B community are poorly identified and addressed in primary care; thus, the educational video was created to address the perceived gaps. Improved provider knowledge and enhanced patient care can enhance patient satisfaction with the delivery of care.

Keywords: primary care provider, blind, visually impaired, patient satisfaction, provider education

Can You See Me? Primary Care Provider Education to Satisfy the Visually Impaired

When it comes to one's health and well-being, most people seek their healthcare providers' guidance. This idea does not change with disabled patients, including the visually impaired or blind. They may request more assistance, especially if their vision begins to decline as adults due to glaucoma or other diseases. Primary care providers (PCPs) should treat everyone equally and appropriately. However, most visually impaired communities perceive that they are not receiving the proper care from their providers for some unknown reason.

Background and Significance

Problem Statement

Globally, there are 2.2 billion people with vision impairment or are blind, out of which one billion could have prevented the condition but did not seek attention (World Health Organization, 2019). According to the Centers for Disease Control and Prevention (CDC, 2017), nationally, there are approximately twelve million people over 40 who are visually impaired. Of the 12 million, one million are blind, three million have vision impairment after correction, and eight million have visual impairment due to uncorrected refractive error. Vision impairment costs an estimated \$500 million annually in health costs (Cheney, 2019). The prevalence of visual impairment is the highest in California (797,300 people) than all the other states in the U.S. (National Federation of the Blind, 2019). Diabetes has caused ninety percent of blindness, which is preventable (CDC, 2017). Regardless of their path to being visually impaired or blind, this "disability" should not change how they receive their health care.

Upon speaking to the President and members of a nonprofit organization serving the visually impaired/blind (VI/B) community in the western United States, they voiced many issues. One common theme was their concern that PCPs are unaware of how to interact or verbalize with

blind patients, which affects their care. They would like the PCPs to be more understanding, compassionate, and culturally competent. Since there are not many individuals aware of how to interact with the VI/B, they tend to isolate themselves from society, creating a more expansive community gap. National data shows that more than half of Americans do not seek eye care due to a lack of awareness (CDC, 2017). Understanding that there is a problem, issue, or gap allows for an intervention to alleviate the visually impaired/blind community and PCP disparity.

Purpose and Rationale

As the number of VI/B individuals increases with curable conditions, most patients do not seek the necessary medical attention (Unite for Site, n.d.). They should receive the same safe and respectful patient experience as sighted people (Egan, 2016). The nonprofit organization serving the VI/B community members reports that PCPs often lack knowledge, communication skills, and compassion when providing to visually impaired clients.

Improper management or delivery of care has caused fear and frustration for the visually impaired to seek medical attention. Without seeking assistance, the patient's declining vision could ultimately result in blindness. The purpose of the paper is to discuss the background and significance of the problem that the visually impaired/blind community face with healthcare providers, summarize the current literature, and determine if education intervention/information is needed to improve healthcare delivery and patient satisfaction. The paper will also discuss the conceptual framework and evidence-based practice model used to implement the intervention for practice change and the potential outcomes this change will present.

Background/Significance

Primary Care Providers

Primary care providers are in the position of prevention and management of diseases among the community. They all have been well-versed with gathering pertinent information on medical history and physical exam, along with diagnostic interpretations. Patients rely on their PCP for assistance and guidance in their medical treatments (Rotshtein et al., 2015). PCPs are generally the first healthcare professionals to detect any changes or loss in vision. With the new changes, they can respond quickly with the appropriate interventions, including referrals to specialists, to prevent further vision loss (Marra et al., 2016).

Liu and Swearingen (2017) stated that PCP's diabetic eye screening rates are low because they feel their eye exam skills are not adequate to perform eye screenings. The training they have with the ophthalmoscope is limited, and they may not feel comfortable with the accuracy of their exams (Liu & Swearingen, 2017). PCPs are knowledgeable of the factors that lead to visual impairment/blindness; however, they do not pursue this care/treatment due to lack of expertise and other resources (Rotshtein et al., 2015).

Primary Care Educational Information

Lack of awareness of the patient's vision needs can serve as a barrier to providing the appropriate management and treatment (Dick et al., 2015). A study on vision awareness training has shown a direct positive impact on PCP's knowledge and awareness (Dick et al., 2015). Education, care comprehension, and application are vital factors to this intervention. Thus, when PCPs are consciously aware of these skills, the patients become comfortable with their providers. Examples may be knowing why they wear glasses, their medical history, and recognizing signs of vision loss; these are factors needed to provide adequate care to the visually impaired/blind

community. As part of continuous skill/self-development, training is an integral part of healthcare and can improve care quality (Garzonis et al., 2015).

Primary care providers should demonstrate cultural competence; ongoing education and training are necessary to provide culturally sensitive care to the visually impaired community (Young & Guo, 2016). When a PCP is culturally competent, there is a collaborative relationship, and compliance with treatment can be attained (Teutsch et al., 2016).

The American Academy of Family Physicians (2013) provides best practice tips for patients who are visually impaired or blind such as: ask how the patient wants materials (i.e., large font, recorded); ask what system works for the patient to take medications (one rubber band on bottles for one time a day); read aloud what is written aloud in their medical record; when entering the room, say one's name and title; speak directly to the patient, not the sighted person; if the patient has a guide dog, ask for permission before petting or greeting the animal; inform the patient of one's actions and procedures; let the patient feel the equipment, and say goodbye when one leaves the room.

Primary Care Current Practice

Due to the lack of knowledge that PCPs have, visually impaired patients experience misdiagnoses, delaying treatment, or referrals. A study was conducted with physicians to determine their understanding and gaps when treating glaucoma patients (Rotshtein et al., 2015). Most of the PCPs responded that they were provided sufficient glaucoma-related knowledge during medical school, but more than half did not receive knowledge or skills during residency (Rotshtein et al., 2015). One study shows that 54% of physicians were not aware, and 19.7% knew very little of the Charles Bonnet Syndrome, characterized by visual hallucinations in patients with vision loss. Misdiagnosis of psychosis can occur. Awareness is crucial to avoid

misdiagnosing a patient from having a mental disorder (Gordon & Felfeli, 2018). Based on the studies, PCPs are not comfortable with their screening skills, and missed diagnoses can occur.

Improved Healthcare Delivery and Patient Satisfaction

Everyone strives for better healthcare, that does not differ for those who are visually impaired or blind. Boxell et al. (2017) conducted a cross-sectional survey to determine if the healthcare experience improved over time. One survey was conducted in 1999, and the second survey in 2013. Guidelines were published, and providers used them for setting standards of best practice. The researchers distributed a survey in 1999 before the publication of the guidelines and another survey in 2013; the patients were generally more satisfied with their diagnostic consultation (61% vs. 76%; Boxell et al., 2017). When it came to general practitioners' knowledge of acute macular degeneration, in the 2013 survey, 23.8% were "very well informed" about their condition, compared to 16.4% in 1999. In 1999, 31.2% were "not at all well informed," compared to an increase in 2013 of 39.3% (Boxell et al., 2017). Overall, the 2013 survey found significant improvement and satisfaction with diagnostic consultation (Boxell et al., 2017).

One study assessed patient satisfaction immediately after primary care interaction. With the providers' current knowledge, some of the participants' satisfaction levels were not significant; after specific guidelines regarding eye care were released and providers adhered to the guidelines, patient satisfaction increased. Other studies included an educational intervention for providers; and assessed how they felt about eye care immediately after and a follow-up several months or years later. With the intervention, providers felt adequate in providing eye care. The evidence was showing that specific vision education, healthcare delivery improved.

Internal Evidence

The organization did not provide any hard data on their visits with PCPs; therefore, soft data was gathered based on interviews with the members. When asked if the community members had any healthcare issues, members identified: accessibility to healthcare, transportation, lack of compassion and empathy, and many mentioned that their PCPs should be educated on how to care for and/or treat the VI/B community.

PICOT Question

Preliminary interest in this problem led to an inquiry of current evidence to determine the best interventions for providing equal care to the visually impaired/blind community. The recent evidence has led to the PICOT question, what educational information (I) should be shared with healthcare providers (P) to improve visually impaired/blind patient satisfaction (O) when compared to current practice (C)?

Evidence Synthesis

Search Strategies

An exhaustive search of the most current evidence in the electronic databases was executed to answer the PICOT question. The databases included PubMed, Cumulative Index of Nursing and Allied Health (CINAHL), Cochrane Database, and ProQuest. Keywords used included *blindness, visually impaired, low vision, visual impairment, blind, vision loss, delivery of care, educational intervention, provider education, provider knowledge, primary care education, clinicians or nurses or healthcare provider education or physician or doctor, nurse practitioner, healthcare system, patient outcomes, quality of life, health outcomes, patient satisfaction, primary care, visual impairment education, low vision education*. The results were limited to within the last five years. Terms were combined, and limits were applied to search for appropriate evidence-based articles. Results were then hand searched based on title and abstract

in any form that contained healthcare provider education has improved patient outcomes for the visually impaired/blind community. For all adult populations, different diseases that can cause low vision or blindness were considered.

The PubMed Database's initial search using *visually impaired persons* and *education of visually disabled* did not yield any results. During subsequent searches utilizing key terms, *blindness, healthcare provider, and delivery of care* yielded 72 articles, and further inquiries with keywords *awareness training and visual impairment* yielded 138 results. *Provider education and visual impairment* yielded ten results. Keywords *visually disabled* and *delivery of care* yielded 77 items.

The initial search of CINAHL included key terms "*visually impaired or visual impairment or low vision or blind*" and "*healthcare providers or nurses or physicians or doctors*" and "*delivery of care*" yielded 46 results. Twelve results populated when "*blindness or visual impairment or vision loss*" was used instead of "*visually impaired.*" Searches continued with different combinations of the above terms. Key terms such as *patient outcomes or quality of care or health outcomes, or patient satisfaction* were used and generated 192 results.

An initial search of ProQuest with key terms *blindness* and *healthcare provider* and *provider education* generated eight results. With subsequent searches with terms *provider knowledge and low vision*, 16 results populated.

The final database search included all PubMed, CINAHL, ProQuest, and Cochrane, as well. Key terms *patient outcomes and provider education* yielded 329; *education and low vision* yielded 67 results; *educational intervention and low vision* resulted in 22 articles; *patient outcomes and primary care and low vision* yielded 49 results. A thorough examination of the results was needed to determine what studies were pertinent to the issue at hand.

After reviewing the abstract/titles and due to the limited related research articles, ancestry searches allowed for more researched-based evidence. Completion of the rapid critical appraisals allowed for the final ten articles for the literature review. The final yield included six cross-sectional studies, one cohort study, two mixed-method analyses, and one meta-analysis study. Exclusion criteria concluded any articles written before 2015 and children/adolescents younger than 18 years old.

Critical Appraisal & Synthesis

After a thorough and exhaustive search, the final ten articles were appraised using Melnyk and Fineout-Overholt's (2011) rapid critical appraisal checklist. The majority of the studies were qualitative studies with moderate levels of evidence between III to V. Six were cross-sectional studies, one cohort study, one meta-analysis study, and two mixed-method analyses. Of the two mixed-method analyses, one involved a cross-sectional study with participation action research and the other a cohort study with narrative research (see Appendix A, Table A1). Six of the ten articles disclosed their funding source, and none reported any biases. The articles ranged from different countries and different settings (see Appendix A, Table A1). Most of the studies utilized questionnaires sent to a specific group; those who returned completed surveys were counted in the study. Sample sizes and attrition rates varied due to the study's exclusion criteria and completed surveys received (see Appendix A, Table A1).

Of the ten studies, two studies assessed the providers' current knowledge/practice when treating patients in need of eye care; two studies focused on patient satisfaction with PCPs (see Appendix A, Table A2). The studies had an overall theme of providers lacking knowledge of ocular complications and did not have adequate training during residency, but overall patient satisfaction was positive. The study conducted by Ibanga et al. (2017) depicted that patients were

satisfied with physicians' courteousness (61.9%) and communication skills (57.5%), but patient satisfaction for the quality of overall medical care was 35.2%. The other five studies included intervention, a structured one- or four-day training, or guidelines in place. It is unclear which type of structured training was more beneficial. However, both depicted heightened knowledge and confidence to care for patients with ocular diseases (see Appendix A, Table A1, and A2). However, one study did show an increase in patient satisfaction when an intervention guideline was placed (Boxell et al., 2017). Several studies also identified barriers that affected eye care (see Appendix A, Table A1, and Table A2).

The tools' reliability and validity were difficult to assess due to failure to mention, or questionnaires were developed within the study and approved by their experts. The two studies measuring patient satisfaction used the Patient Satisfaction Questionnaire-18 (PSQ-18), a highly validated and reliable tool (see Appendix A, Table A1). The studies associated with patient satisfaction assessment were homogenous; the patients requiring eye care but having ocular complications were not explicitly mentioned. The years of provider experience depicted heterogeneity regarding population demographics, ranging from less than five years to 15 years (see Appendix A, Table A1). The studies selected addressed the variables needed to address and answer the PICOT question.

Conceptual Framework and EBP Model

Theory of Interpersonal Relations

Theories are abstract generalizations that systematically explain relationships among phenomena (Polit & Beck, 2017); whereas, frameworks depict core concepts and their relationships to each other and conceptualize an intervention (Fogarty International Center, n.d.). In 1952, Hildegard Peplau developed a middle-range theory acknowledging the importance of

patients' experiences, the Theory of Interpersonal Relations (Hagerty et al., 2017; see Appendix B, Figure 1). The theory emphasizes patient experiences and the nurse-patient relationship; the focus should be on the patient, their needs, and their perception about the care received (Hagerty et al., 2017). This theory suggests that the nurse (nurse practitioner/PCP) – patient relationship is essential and providing adequate knowledge and needs can improve patient experiences/satisfaction (Hagerty et al., 2017).

The theory involves three phases: orientation, working, and termination (Hagerty et al., 2017). During the orientation phase, nurses (or primary providers) can help patients adjust to their current experiences, which could be a new vision impairment diagnosis. They continue to work together, making assessments, teaching, learning, and contributing to the interdisciplinary plan of care. The therapeutic form of communication, providing reflective and nonjudgmental feedback, can promote an improved provider-patient relationship. Furthermore, the termination phase's final stage may not necessarily mean the end of the relationship but relates to teaching patients' disease management at home (Hagerty, 2017). Relationships do not conclude, but the patient is now held more responsible for their health management.

When a PCP has insufficient knowledge of vision awareness, then the relationship between provider and patient is affected. Lack of knowledge may deteriorate the sense of trust a patient would have towards his provider. With adequate education and explicit processes in place, results can be promising. The relationship between provider and patient may improve and allows for a more personal, trustworthy relationship.

The Star Model of Knowledge Transformation

The Star Model of Knowledge Transformation (see Appendix B, Figure 2) guides the application of the proposed project's implementation. The model is a five-point star, which

defines the different forms of knowledge: point 1, discovery; point 2, evidence summary; point 3, translation into action; point 4, integration into practice is evidence-in-action; and point 5, evaluation (Stevens, 2013). Members of the visually blind community have voiced their concerns regarding the lack of knowledge with healthcare providers. One has discovered that there is an issue with a lack of visual awareness (Point 1). With limited evidence, it was addressed that increased training/education increases knowledge and confidence in treating patients with vision impairment (Point 2). This model can provide the structure to create guidelines (Point 3). Questionnaires and interventions can guide the information so that there is an improvement in the delivery of care and patient satisfaction. The intervention development also serves as a translation into an action point. When implemented into practice (Point 4) and evaluated from the questionnaires (Point 5), one can determine if the intervention has improved patient care. Evaluation is an ongoing process; if the specific intervention does not work, research is continued, and a different approach should occur. All patients should be treated equally, and those with disabilities should not be discriminated against. The provider should adjust to the patients' needs, but the delivery of care should be consistent.

The Star Model of Knowledge Transformation, addressing all five points, is enclosed in a circle displaying its ongoing gathering information, applying, reapplying, assessing, and reassessing. The Star Model of Knowledge is a continuous process that allows for incorporating different interventions within the process. The Star Model of Knowledge Transformation ties in with the Theory of Interpersonal Relations in that a strong relationship between patient and provider will allow for easy integration into practice. With learned skills and shared knowledge, patients are more willing to interact with their providers, leading to a more positive outcome. If

the treatment or plan falls short, re-evaluation can take place. This continuous process allows for the incorporation of different interventions within the process.

Methods

Ethical Considerations and Human Subject Protection

The CITI Program Social and Behavioral Research training was done and completed. The Institutional Review Board (IRB) granted an expedited review on September 10, 2020 (Study 00012417). After IRB approval, informed consent of a human subject for research was obtained by completing the surveys. During the project, the participants' ethical rights were not compromised, and their confidentiality was respected. Data storage will remain confidential, and access to study data will be available to the author and mentor.

Population and Setting

Visually impaired/blind members of the nonprofit organization

The members of the nonprofit organization serving the VI/B community in the Southwest United States have voiced their concern about their PCP's knowledge of the treatment causing a visual decline. Due to the PCP's minimal understanding of caring for their visually impaired patients, delivery of care has been affected. If the PCP is knowledgeable, their confidence may increase, thus increasing patient satisfaction. A study performed by Boxell et al. (2016) stated that there was increasing satisfaction with healthcare experiences after the intervention.

The project population, members of the nonprofit organization, consisted of adults older than 18 years of age who are blind or visually impaired, including any eye/vision-related diagnosis.

Primary Care Providers

Primary care providers identified by the blind community are in the position of prevention and management of diseases. PCP are taught to obtain a thorough history and physical, order diagnostic tests, and act appropriately on the results. Patients rely on their PCP for assistance and guidance in their medical treatments (Rotshtein et al., 2015). As the initial contact person for patients experiencing vision changes, rapid assessment and appropriate referrals can prevent or slow further vision loss (Marra et al., 2016).

A study conducted by Liu and Swearingen (2017) stated that the PCP is educated on diabetic eye screening. However, screening rates are low because they feel their eye exam skills are not adequate to perform eye screenings. The training they have with the ophthalmoscope is limited, and they may not feel comfortable with the accuracy of their exams (Liu & Swearingen, 2017). PCPs know the factors that lead to visual impairment/blindness; yet, they do not provide the appropriate assessment needed due to a lack of expertise and other resources (Rotshtein et al., 2015).

With increased knowledge, eye exams can be adequately performed, and confidence increased; patients will hopefully be confident in their providers, and patient satisfaction will increase.

Practice, Process, or System Changes

Change is necessary, patients seek medical assistance, and the visually impaired are no different. According to the nonprofit organization members, some of their providers and office staff do not accommodate the visually impaired. One participant mentioned that he was given a form to fill out but could not read it; the office staff asked if someone accompanied him to read it. The patient said, “No,” so the staff read the form to him. Still, the patient felt violated that his

information was being made public in the lobby (Participant 1, personal communication, October 22, 2020). Several participants mentioned that the physician would leave the room without saying a word, and they were “talking to the wall.” The provider and the staff’s current practice requires attention so that they are prepared to handle the visually impaired community’s needs.

Project Description, Timeline

Team development, intervention design, and participant and provider questionnaire search/design time frame would occur from May through July. IRB documentation submission and approval July through September, final approval granted September 10, 2020. VI/B participant survey interviews began in October and were completed in November 2020. The PCP received the pre-intervention questionnaire in the email via a link on OuestionPro; unfortunately, the PCPs of the VI/B participants have not responded. With the expertise of Dr. Linebarger, an ophthalmologist for Sharp Reese-Seely, a provider educational video was developed. Data analysis will occur once all the surveys are collected.

The intended project was to consist of pre- and post-intervention questionnaires administered to the VI/B and their primary care providers and an educational video with resource links. The patient questionnaires will include the National Eye Institute Visual Functioning Questionnaire-25 (VFQ-25) and the Patient Satisfaction Questionnaire-18 (PSQ-18). The VFQ-25 measures the vision-targeted health status important for persons who have chronic eye diseases (Mangione et al., 2001). The PSQ-18 will measure patient satisfaction with medical care (Marshall et al., 1994). The provider questionnaire was developed with input from the author’s team, which included include Dr. Linebarger; Dr. Kapur, an orthopedist with experience in primary care at Kaiser Permanente; Dr. Moffett, Ph.D., FNP-BC, ASU professor and mentor;

and the author. This survey will measure the primary care provider's knowledge of eye/vision care.

Initially, the participants would consist of the nonprofit organization members and their primary care providers; unfortunately, the VI/B participants' PCPs did not respond to the pre-intervention survey. For VI/B participants, telephone contact was made to invite participation, the consent was read to the participants, and they would be allowed to agree to participate or not. Once consents were received, the participants were provided with the pre-intervention questionnaire(s). The author conducted the telephone interviews for the VI/B. Minimal training is required for this activity; the interviewer will simply read the statement and the answer categories. The PCP questionnaire was uploaded onto QuestionPro, and the link to the questionnaire for the primary care provider will be emailed through the ophthalmologist partner's healthcare organization.

Personal de-identifiers were used, the last four digits of the phone number to link pre- and post-responses. VI/B participants' responses were entered into IntellectusStatistics, descriptive and Pearson correlations were used to analyze the data. PCP responses are still pending, but with the intent to compare the pre- and post-intervention questionnaires. This comparison will help determine if the educational intervention helped advance the provider's knowledge and increase patient satisfaction.

Instrumentation, Data Collection, and Data Analysis Plan

Instrumentation includes patient satisfaction questionnaire (PSQ-18), National Eye Institute Visual Functioning Questionnaire-25 (VFQ-25), provider questionnaire is a descriptive survey constructed with an ophthalmologist partner, general medicine physician, and author's mentor. The VI/B questionnaire was distributed via telephone interview, and the provider

questionnaire was sent via email link. The collected data was inputted in the IntellectusStatistics program for analysis. The post-intervention results will be compared to the pre-intervention results once collected.

Budget and Funding

Due to the pandemic, the educational training was done via recorded video. Monies spent will be on printing and mailing of consents and questionnaires, if necessary. The budget will range from zero dollars to about \$365 (See Appendix C). Funding would have been provided from the organization's fundraising, again, if necessary. Currently, there were no monetary expenses needed for the project.

Results

Presently, 30 voluntary, consented VI/B participants completed the demographics, PSQ-18, and VFQ-25 questionnaires via telephone interview.

Descriptive Statistics

The most frequently observed category of SEX was Female ($n = 20$, 67%). The most frequently observed category of AGE was 46+ ($n = 27$, 90%). The most frequently observed category of ETHNICITY was Caucasian ($n = 14$, 47%). Both Eyes were affected under the Visual Acuity category ($n = 30$, 100%). The most frequently observed category of Main Cause of Vision Loss was Other ($n = 10$, 33%). The most frequently observed category of Visual Acuity was Blind ($n = 20$, 67%, see Appendix D, Table D1). The most frequently observed category of Main Cause of Vision Loss was Other ($n = 10$, 33%, see Appendix D, Table D2). A Boxplot describes the Age of Diagnosis by the Main Cause of Vision Loss (see Appendix D, Figure D3).

Patient Satisfaction Questionnaire (PSQ-18)

Descriptive Analysis

Patient satisfaction is an essential quality in healthcare. When patients are content with their healthcare providers, they will most likely adhere to their medical regimen. The PSQ-18 was used to assess patient satisfaction with the Likert scale. It contains several domains: general satisfaction, technical quality, interpersonal manner, communication, financial aspects, time spent with the doctor, and accessibility and convenience. The average patient satisfaction score for the VI/B members of the nonprofit organization was 46.73 (maximum score is 90, and the minimum score is 18). Financial aspect and communication had the most favorable evaluation (2.75 and 2.73, respectively), and accessibility and convenience had the most negative evaluation (2.44, see Appendix E, Table 1).

Pearson Correlation Analysis

A Pearson correlation analysis was conducted between the Main Cause of Vision Loss and the Sum Composite Score. Cohen's standard was used to evaluate the strength of the relationship, where the coefficients between .10 and .29 represent a small effect size, coefficients between .30 and .49 represent a moderate effect size, and coefficients above .50 indicate a large effect size (Cohen, 1988). A Pearson correlation requires that the relationship between each pair of variables is linear (Conover & Iman, 1981). This assumption is violated if there is curvature among the points on the scatterplot between any pair of variables (see Appendix E, Figure E1). A regression line has been added to assist the interpretation. The result of the correlation was examined based on an alpha value of 0.05. There were no significant correlations between any pairs of variables (see Appendix E, Table E1).

Visual Functioning Questionnaire (VFQ-25)

Descriptive Analysis

The VFQ-25 measures the influence of visual disability and visual symptoms on health domains. It is scored on a 0 to 100 scale; the lowest possible score is zero, and the highest is 100; the high score represents better functioning (Mangione et al., 2001). The average score was 45.29 ($n = 30$, 45%), representing less than half the functioning level. The most frequently observed category of Worry about Eyesight was None of the time ($n = 10$, 33%). The most frequently observed General Health categories were Fair, Very Good, and Good, each with an observed frequency of 9 (30%). The most frequently observed category of Pain or Discomfort in and Around Eyes was Mild ($n = 10$, 33%). The most frequently observed category of Eyesight using Both Eyes was Completely Blind ($n = 12$, 40%). Frequencies and percentages are presented in Appendix F, Table F1.

Pearson Correlation Analysis

A Pearson correlation analysis was conducted between Main Cause of Vision Loss and General Vision. Cohen's standard was used to evaluate the strength of the relationship, where coefficients between .10 and .29 represent a small effect size, coefficients between .30 and .49 represent a moderate effect size, and coefficients above .50 indicate a large effect size (Cohen, 1988). A Pearson correlation requires that the relationship between each pair of variables is linear (Conover & Iman, 1981). This assumption is violated if there is curvature among the points on the scatterplot between any pair of variables. Appendix F, Figure F1 presents the scatterplot of the correlation. A regression line has been added to assist the interpretation. The result of the correlation was examined based on an alpha value of 0.05. There were no significant correlations between any pairs of variables (see Appendix F, Table F2).

Impact of Project

Before interviewing the participants, they were read the recruitment letter/consent. After explaining the project and its intended goal, many of them were grateful for having someone on their side, helping fight for improved services. Though some are pleased with the providers they currently have, others wanted them to learn how to care for the visually impaired. Providing improved healthcare services for the visually impaired will improve patient satisfaction. Addressing the lack of visual awareness would enhance the provider's overall care for their patients, especially the visually impaired/blind community. Increased awareness, tools, or resources, and knowledge can promote improved healthcare and diagnosis/treatment. Enhancing care would improve patient satisfaction, influence patient adherence to treatment, and decrease annual vision care costs.

Previous studies have shown that there has been minimal training in medical school on eye care. Focus on eye/vision care, and delivery of care would needs focus. Understandably, a provider may not know everything at the moment, but knowing the basics, such as the most common diseases responsible for vision deterioration, screening for impaired visual acuity and, eye exams, is essential. Receiving an educational intervention to “brush up” on a specific body system may enhance the provider's confidence to assess, diagnose, and treat a patient. Healthcare is ever-changing, and keeping up is necessary to maintain competency, but the basics should not be abandoned. Eye care and vision awareness are essential to primary care. Proper eye exams and screenings can prove beneficial for the patient; when a provider is well-versed in vision care, patient satisfaction increases and enhances the patient-provider relationship.

Sustainability

Education is endless; some information remains the same, while others are changing. Providers must be up to date with the current information necessary to care for their patients. The educational video created for this project will circulate within the ophthalmologist's healthcare organization and the nonprofit organization's website. The technological, virtual world will facilitate the video's circulation, allowing more providers to become aware of the issue.

Discussion

The author conducted telephone interviews with 30 voluntary, visually impaired participants; they shared their experiences while completing the PSQ-18 and VFQ-25. The needs of the visually impaired/blind community are often poorly identified and addressed. Having the opportunity to work alongside an ophthalmologist and create the educational video can allow others to learn what is necessary to care for the VI/B community.

Limitations and barriers

Due to the COVID-19 restrictions, direct engagement with the VI/B participants' PCP was not feasible. Primary care offices were contacted, and some provided direct PCP email addresses, while others offered alternative email addresses that would be forwarded to the provider. Some were not allowed to disclose the provider's email addresses. To those who provided their emails, no responses were received. At this moment, there are no PCP participants, but IRB has allowed for a broader PCP participation, the ophthalmologist's healthcare organization.

Relate Findings to Other Literature

Due to the barriers and limitations from COVID and lack of PCP participation, the author could not assess the correlation between the VI/B patient satisfaction with their PCP after the educational intervention.

Recommendations for Future Study/Research

Learning to address the needs of those with different limitations is ongoing for providers. Provider learning is constant, and enhanced learning opportunities for PCP are essential. Other disabilities or patient limitations may need to be assessed so that education can be implemented to improve patient care.

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Appendix A

Evaluation and Synthesis Tables

Table A1

Evaluation Table

Citation	Theory/ Conceptual Framework	Design/Method	Sample/Setting	Major Variables Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision for practice/ application to practice/ Generalization
Abdulsalam, S., Ibrahim, A., Saidu, H., Muazu, M., Aliyu, U., Umar, H., Gezawa, I., & Owolabi, L. (2018). Knowledge, attitude, and practice of diabetic retinopathy among physicians in Northwestern Nigeria Funding: None	Theory of Planned Behavior-inferred.	Design: Descriptive cross-sectional survey Purpose: To assess the level of knowledge, attitude, and practices of physicians to D.R. screening, practicing managing persons with D.M., to identify possible ways of improving eye care as part	n = 105 Demo: Age: none mentioned G: 84 Male, 26 Female Yrs exp.: 80 ≤ 5 yrs; 20 between 6-10yrs; 5 > 10 yrs Population: GP, residents, consultants in family medicine, internal medicine, other doctors managing DM PT	IV: Current knowledge DV1: Knowledge assessment to D.R. screening DV2: Attitude assessment to DR DV3: Practice assessment to D.R.	20-item self-administered knowledge, attitude, and practices questionnaire (α = 0.64, n = 105) 5-point Likert scale	Chi-square test	DV1: 63% were aware of effective methods of delaying the onset of D.R., and 76.2% knew how often patients with D.M. should have their eyes examined. DV2: Greatest barriers to performing eye exams were the lack of functional ophthalmoscopes (71.5%). 81.9% state that it is not	LOE: III Strengths: Good qualitative design. The study pioneered a preliminary survey on knowledge, attitude, and practices. Weaknesses: Study conducted in tertiary healthcare facilities, not generalizable to lower levels of health care. Conclusions: The study showed good knowledge regarding the recommended frequency of eye exams. Showed that knowledge about ocular complications of

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<p>Country: Northwestern Nigeria</p> <p>Bias: None noted</p>		<p>of the overall diabetes care.</p>	<p>Setting: tertiary health hospitals</p> <p>Exclusion: Ophthalmologists, anesthesiologists, obstetricians, gynecologists, pediatricians, surgeons</p> <p>Attrition: 95.4%</p>				<p>part of their job and would instead refer.</p> <p>DV3: 36.2% perform routine eye exams on persons with D.M. at their facility.</p> <p>Correlation analysis between: Knowledge and attitude (r = 0.136, P = 0.166) Attitude and practice (r = -0.143, P = 0.144 Practice and knowledge (r = 0.086, P = 0.385)</p>	<p>D.M. was suboptimal due to the unaccustomed use of ophthalmoscope and dilating eye drops</p> <p>Feasibility/Applicability to P.T. population: Identifying the current knowledge a primary care provider knows about eye care is essential and applicable for the population. When disparities are known, the implementation of training can help decrease any insecurities.</p>
<p>Boxell, E. M., Amoaku, W. M., & Bradley, C. (2017). Healthcare</p>	<p>Health Belief Model - inferred</p>	<p>Design: Cross- sectional survey</p> <p>Purpose: To determine if</p>	<p>n=1187 (1999 sample)</p> <p>n=1169 (2013 sample)</p>	<p>IV: Release of guidelines for AMD in 2009</p> <p>DV: Improved</p>	<p>Macular Disease Society Questionnaire</p>	<p>Pearson’s chi- squared analysis, one- way independent</p>	<p>An overall increase in patient satisfaction experiences after</p>	<p>LOE: III</p> <p>Strengths: Thorough explanation of the</p>

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<p>experiences of patients with age-related macular degeneration: Have things improved? Cross-sectional survey responses of Macular Society members in 2013 compared with 1999.</p> <p>Funding: Ph.D. studentship funded by Macular Society. Royal Holloway. Alcon Laboratories</p> <p>Country: United Kingdom</p>		<p>healthcare experiences had changed after 2009 guideline publications</p>	<p>Demo: Age (M) of 1999 sample: 78.34 2013 sample: 80.15</p> <p>G: Female gender of 1999 sample: 69% 2013 sample: 69.4%</p> <p>Population: Members of the Macular Society</p> <p>Setting: Macular Society</p> <p>Exclusion: have other macular conditions, under 50 years at diagnosis, missing data on surveys.</p> <p>Attrition: 59% (1999) 29% (2013)</p>	<p>healthcare experiences for P.T.s</p> <p>Guidelines: All P.T.s require clear DX, P.X., written info, awareness of the impact of DX of progressive eye condition, and empathy; visual hallucinations (CBS) for proper DX.</p>	(validity and reliability not mentioned)	ANOVA, Mann-Whitney test	<p>guidelines publications noted. Per question shows significance.</p> <p>Experiences in DX consult 1999 vs 2013: $\chi^2(1) = 57.59, p < 0.001$</p> <p>Mann-Whitney test found no significant differences between 1999 and 2013 in the knowledge of AMD. ($U = 321, 207.00, z = -0.67, p = 0.50$)</p> <p>A significant difference in supportiveness – more dissatisfied with the support ($U = 314, 740.00, z = -7.66, p < 0.001$)</p>	<p>process for extracting information</p> <p>Weaknesses: Missing data that could not be used to compare 1999 and 2013 survey responses. Sampling limited to Macular Disease Society members.</p> <p>Conclusions: Improved patient satisfaction and outcomes after the 2009 Guidelines were released.</p> <p>Feasibility/Applicability to Pt. population: Applicable to follow guidelines for patient care and outcomes.</p>

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Bias: None noted								
Dick, J., Finlayson, J., Neil, J., Mitchell, L., & Robinson, N. (2015). Vision awareness training for health and social care professionals working with people with intellectual disabilities: Post-training outcomes	Health Belief Model - Inferred	Design: Cohort study: pre- and post-training questionnaire Purpose: Evaluate the VAT over a 12- month assessment period to determine whether training increased knowledge, awareness, and confidence	n: 104 who participated in VAT Demo: Age (M): 42 G: 81% Female Yrs exp: 15 years working with clients with intellectual disabilities Population: Health and Social care professionals Setting: class size 5-14 trainees Exclusion: None mentioned Attrition: 87%	IV: 1 day VAT DV1: Awareness of visual impairment DV2: awareness of barriers DV3: Increased confidence 1-day VAT: vision and visual impairments, anatomy, leading causes of sight loss, recognizing signs of sight loss, raising awareness of barriers, supporting people with intellectual disabilities and visual impairments	Pre- and post- training questionnaires in the form of multiple- choice, ‘yes, aware’ or ‘no, not aware,’ open-ended questions, and 5-point Likert scales. Questionnaires were developed by the research team (Royal National Institute of Blind People) and piloted with four health care professionals who attended VAT.	Wilcoxon matched-pair tests	Participants significantly increased knowledge and awareness ($p \leq 0.001$) Participants were significantly aware of barriers: access ($p \leq 0.001$), appt times ($p \leq 0.001$), the outcome of the eye ($p = 0.021$) Participants significantly increased confidence in signs of sight loss ($p \leq 0.001$).	LOE: IV Strengths: Multiple styles of instrumentation depending on the question. High participant response. Weaknesses: The post- training questionnaire was done immediately after training and not rechecked after some time. Conclusions: Training provided increased knowledge of the condition, barriers, and confidence to health and social care providers Feasibility: Training of healthcare providers would be feasible to understand individuals with visual disabilities better.

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Bias: None noted								
Ibanga, A. A., Nkanga, D. G., Asana, U. E., Duke, R. E., Etim, B. A., Nkanga, E. D., Utam, U. A., Agweye, C. T., & Udofia, O. O. (2017). Patient’ satisfaction with eye care services in the University of Calabar teaching hospital.	Social Cognitive Theory - inferred	Design: Descriptive cross-sectional study Purpose: To determine P.S. regarding ophthalmic OPT clinic to measure the quality of service and determine areas where improvement and additional resources are needed.	n = 398 Demo: Age (M): 39.91 G: 46.5% Male; 53.5% Female Yrs exp: N/A Population: Patients attending the eye clinic Setting: University of Calabar Teaching Hospital Exclusion: P.T.s too ill to participate in the interview, non- consenting P.T.s, P.T.s younger than 18, and not accompanied by a guardian	IV: Interview after receiving care DV: P.T. experience and satisfaction	A questionnaire adapted from PSQ-18 (validated from previous studies)	Bivariate analysis Multiple logistic regressions Pearson coefficient of correlation with p < 0.05 being statistically significant	Satisfaction w/accessibility and medical care in the eye clinic: 95.4% Satisfaction with staff: Doctors 61.9% courteous and 82.1% patient. Communication and explanation about the condition 57.5% Nurses 55.4% friendly and 48.9% communication and explanation Optometrists 74.2% friendly. Explanation 69.8%	LOE: IV Strengths: good qualitative design Weaknesses: Attrition rate not mentioned. The interview was immediately after care. Conclusions: P.S. measurement evaluates health care services using P.T.’s perspectives, deficient or weak areas, and generating valuable ideas in solving gaps. Feasibility/Applicability to P.T. population: P.S. surveys applicable to the population to determine gaps and identify.
Funding: None mentioned								
Country: Nigeria								
Bias: None noted								

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			Attrition: 100% (Total interviewed 398)				Overall satisfaction: 35.8%	
Jolley, E., Mafwiri, M., Hunter, J., & Schmidt, E. (2017). Integration of eye health into primary care services in Tanzania: A qualitative investigation of experiences in two districts Funding: Sightsavers Country: Tanzania Bias: None noted	Health Belief Model - inferred	Design: Cross-sectional qualitative study Purpose: To examine how eye health services are integrated into the PHS from the perspective of PHW's trained in primary eye care	n = 20 PHW Demo: Age: N.S. Gender: 10 Female, 10 Male Yrs exp: (M) 5 Population: PWH Setting: PHS Exclusion: None mentioned Attrition: 17% (PHW)	IV: 4-day training course DV: Eye health services integrated into PHS 4-day training course objective: improve access to primary eye care by early identification, TX, and referral of eye diseases	In-depth interviews with a semi-structured topic guide Interviews digitally recorded and transcribed verbatim	Thematic content analysis	The majority of participants were satisfied with the training and reported feeling more confident in identifying and treating P.T.s with eye conditions. Eye health policy: eye health not perceived as a priority leading to reduced funding Health financing: healthcare generally underfunded Equipment and supplies: inadequate	LOE: IV Strengths: Good qualitative method Weaknesses: Narrative, low LOE. Attrition rate low due to purposive sampling. Conclusions: The study identified several challenges in the integration of eye care activities into general primary health systems; these barriers related to the broader health system environment; general eye health system; and the primary eye care Feasibility/Applicability to P.T. population: Eyecare training would be appropriate for healthcare providers.

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							equipment available P.T. records: inadequate data on eye diseases P.T. referrals: no formal referral system in place Post-training supervision of staff: no regular supervision of PHW by an eye health specialist	
Mafwiri, M., Jolley, E., Hunter, J., Gilbert, C. E., & Schmidt, E. (2016). Mixed methods evaluation of a primary eye care training program for primary health workers in	Health Belief Model - inferred	Design: a mixed-method study Cohort studies: Pre- and immediate post-training knowledge assessment Narrative research: In-depth face to	n=60 trainees n=20 sampled for interviews Demos: Age: not mentioned G: equal (50/50) Yrs exp: 5 Population: PWH	IV: 4-day training with five workshops DV1: Awareness of eye conditions DV2: Basic ability to diagnose and treat DV3: Knowledge of	Pre- and post-semi-structured assessment (validity and reliability not mentioned) In-depth interviews (40 min, audio-recorded, and transcribed.	Paired t-test	56 of 60 participants scored higher on the post-training assessment. Post-training assessment increased 17.5% (t(59) – 11.6, p<0.0001) DV1: Increased understanding of	LOE: IV Strengths: Strong qualitative design Weakness: training time too short, esp. for skills. Low LOE. Attrition rate low due to purposive sampling. Conclusions: The training was successful in raising PHW’s

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Citation	Theory/ Conceptual Framework	Design/Method	Sample/Setting	Major Variables Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision for practice/ application to practice/ Generalization
Morogoro Tanzania. Funding: Sightsavers Country: Tanzania Bias: None noted		face interviews 2-3 years after training Purpose: To evaluate the training of PHW: awareness of eye conditions, basic DX and TX skills, and referral to a specialist	Setting: Primary health facilities Exclusion: None listed Attrition: 52%	when to refer to a specialist 4-day training: educating on raising awareness, health promotion, and practical training			knowledge with eye diseases DV2: Each participant made an average of 3.15/5 correct DX and 4.05/5 correct actions. DV3: A large number of PHW stated knowledge to refer had significantly improved	knowledge, confidence, motivation, and referrals. Feasibility/Applicability to P.T. population: Intervention is relevant and for practical use in a clinical setting
Peterson, K., Huisingh, C., Girkin, C., & Owsley, C., & Rhodes, L. (2018). Patient satisfaction with care in an urban tertiary referral academic glaucoma clinic in the U.S.	Conventional Model of Care	Design: cross- sectional study Purpose: To determine the factors associated with glaucoma, P.S. with medical care for glaucoma	n = 106 Demo: Age (M): 71.2 G: 57% Female Yrs exp.: N/A Population: 47% African descent; 52% European descent; 1% other	IV: Current practice of ophthalmologists at the clinic DV: P.S. with care at the clinic	PSQ-18 (validated for use in a variety of settings, established internal consistency and reliability)	VFI score for glaucoma severity Visual acuity testing Two-sample t- tests: compare mean PSQ-18 demographic characteristics	Mean VFI for the better eye: 76.3 (SD ± 34.4) worse eye 76.3 (SD ± 40.2) P.T.s 60-69 y.o. were more satisfied with the care, interpersonal manner of appt, & time spent with doctors	LOE: IV Strengths: Shows relevance to patient satisfaction with the patient population. Weaknesses: No attrition rate noted. The generic survey did not capture barriers for the specific care of the older glaucoma P.T. population.

Key: AMD-age-related macular degeneration; **appt**-appointment; **ASHA**-accredited social health activist; **CAHPS**-Consumer Assessment for Healthcare Providers and Systems; **CBS**-Charles Bonnet Syndrome; **CD**-chronic disease; **CI**-confidence interval; **DM**-diabetes Mellitus; **DR**-diabetic retinopathy; **DV**-dependent variable; **DX**-diagnosis **G**-gender; **GP**-general practitioner; **HCP**-healthcare professional; **IV**- independent variable; **M**-mean; **MA**-meta-analysis; **MOOSE**-Meta-analysis of Observational Studies in Epidemiology; **N**-number of studies; **n**- number of participants; **N/A**-not applicable; **NS**-not stated; **OPT**-out-patient; **PCP**-primary care providers; **PHC**- primary healthcare; **PHS**-primary health system; **PHW**-primary health worker; **PN**-practice nurse; **POAG**-primary open-angle glaucoma; **PS**-patient satisfaction; **PSQ-18**-Patient Satisfaction Questionnaire; **PT**-patient; **PX**-prognosis; **RS**-relationship; **TX**-treatment; **UAB**-University of Alabama at Birmingham; **VAT**-vision awareness training; **VFI**-visual field index; **y.o.**-years old; **Yrs**-years; **#**-number

Citation	Theory/ Conceptual Framework	Design/Method	Sample/Setting	Major Variables Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision for practice/ application to practice/ Generalization
<p>Funding: National Institute of Aging grant. National Eye Institute grant. EyeSight Foundation of Alabama, Birmingham. Research to Prevent Blindness</p> <p>Country: United States</p> <p>Bias: None noted</p>			<p>Setting: Glaucoma Clinic of the Callahan Eye Hospital Clinic at UAB</p> <p>Exclusion: Non- English speaking; age < 60 yrs; outside enrollment time of 5/5/2015- 7/18/2015.</p> <p>Attrition: 96%</p>			<p>Spearman correlation coefficients: the relationship between PSQ- 18 scores and VFI for better and worse eye</p>	<p>compared to 70 y.o. (Likert scores (M) 4.8, 4.9, 4.7; p = 0.03, 0.009, 0.03, respectively)</p> <p>Non-European P.T.s were more satisfied with communication and time spent with doctors compared to European descent (Likert scores (M) 4.8, 4.7; p = 0.04, p = 0.04)</p> <p>No statistical significance in P.S. based on employment.</p> <p>No statistically significant differences for PSQ-18 dimensions</p>	<p>Conclusions: Overall, participants were highly satisfied with care across all PSQ-18 dimensions.</p> <p>Feasibility/Applicability to P.T. population: P.S. surveys necessary to determine any improvement needs.</p>

Key: AMD-age-related macular degeneration; **appt**-appointment; **ASHA**-accredited social health activist; **CAHPS**-Consumer Assessment for Healthcare Providers and Systems; **CBS**-Charles Bonnet Syndrome; **CD**-chronic disease; **CI**-confidence interval; **DM**-diabetes Mellitus; **DR**-diabetic retinopathy; **DV**-dependent variable; **DX**-diagnosis **G**-gender; **GP**-general practitioner; **HCP**-healthcare professional; **IV**- independent variable; **M**-mean; **MA**-meta-analysis; **MOOSE**-Meta-analysis of Observational Studies in Epidemiology; **N**-number of studies; **n**- number of participants; **N/A**-not applicable; **NS**-not stated; **OPT**-out-patient; **PCP**-primary care providers; **PHC**- primary healthcare; **PHS**-primary health system; **PHW**-primary health worker; **PN**-practice nurse; **POAG**-primary open-angle glaucoma; **PS**-patient satisfaction; **PSQ-18**-Patient Satisfaction Questionnaire; **PT**-patient; **PX**-prognosis; **RS**-relationship; **TX**-treatment; **UAB**-University of Alabama at Birmingham; **VAT**-vision awareness training; **VFI**-visual field index; **y.o.**-years old; **Yrs**-years; **#**-number

Citation	Theory/ Conceptual Framework	Design/Method	Sample/Setting	Major Variables Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision for practice/ application to practice/ Generalization
							based on previous glaucoma therapy.	
Rotshtein, A., Karkabi, K., Geyer, O., & Cohen Castel, O. (2015). Primary care physicians' role perception and self-reported performance in glaucoma care: A survey study Funding: None Noted Country: Israel Bias: None Noted	Theory of Planned Behavior - inferred	Design: Cross-sectional study Purpose: To investigate PCP attitudes toward a role in glaucoma care and perceived barriers towards participation in glaucoma prevention and TX	n = 82 Demos: Age (M): 43 Gender: Men 38%, Female 51% Yrs exp (M): 15 Population: PCP Setting: PCP working in Haifa and Western Galilee District of Clalit Health Services Exclusion: N.S. Attrition: 49% (completed and returned questionnaires)	IV: Current PCP role in glaucoma care DV1: Attitudes and perceptions regarding the role in glaucoma care DV2: Barriers to participating in glaucoma care	Self-administered questionnaire. (Validated by two board-certified PCP and an ophthalmologist specializing in glaucoma care)	X ² test Fishers' exact test for cell frequencies five or less. Correlations between categorical variables – Spearman's rank correlation coefficient Cronbach's alpha – to assess internal consistency. Significant difference defined as alpha < 0.5	DV1: 93% of PCP thought that involvement in glaucoma care could improve P.T.'s adherence and TX Self-reported performance in glaucoma care (Cronbach's alpha = 0.9) significantly lower than the mean score for PCP's perception of their role in glaucoma care (Cronbach's alpha = 0.8) (2.8 ± 1.1; 5.2 ± 0.6, respectively, p < 0.0001)	LOE: V Strengths: Good qualitative design Weaknesses: Low level of evidence Conclusions: 70% claimed they were not provided adequate knowledge regarding glaucoma care during residency training. PCP is aware of his role in glaucoma care and does not pursue it due to a lack of knowledge. Low attrition rate. Feasibility/Applicability to P.T. population: Good to use in practice to determine strength and knowledge of glaucoma and need to refer.

Key: AMD-age-related macular degeneration; **appt**-appointment; **ASHA**-accredited social health activist; **CAHPS**-Consumer Assessment for Healthcare Providers and Systems; **CBS**-Charles Bonnet Syndrome; **CD**-chronic disease; **CI**-confidence interval; **DM**-diabetes Mellitus; **DR**-diabetic retinopathy; **DV**-dependent variable; **DX**-diagnosis **G**-gender; **GP**-general practitioner; **HCP**-healthcare professional; **IV**- independent variable; **M**-mean; **MA**-meta-analysis; **MOOSE**-Meta-analysis of Observational Studies in Epidemiology; **N**-number of studies; **n**- number of participants; **N/A**-not applicable; **NS**-not stated; **OPT**-out-patient; **PCP**-primary care providers; **PHC**- primary healthcare; **PHS**-primary health system; **PHW**-primary health worker; **PN**-practice nurse; **POAG**-primary open-angle glaucoma; **PS**-patient satisfaction; **PSQ-18**-Patient Satisfaction Questionnaire; **PT**-patient; **PX**-prognosis; **RS**-relationship; **TX**-treatment; **UAB**-University of Alabama at Birmingham; **VAT**-vision awareness training; **VFI**-visual field index; **y.o.**-years old; **Yrs**-years; **#**-number

Citation	Theory/ Conceptual Framework	Design/Method	Sample/Setting	Major Variables Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision for practice/ application to practice/ Generalization
							<p>DV2: Barriers included lack of time (45%), lack of knowledge (33%); Glaucoma risk factors (33%) DX eval (48%) TX options and follow up (53%)</p>	
<p>Shukla, P., Vashist, P., Senjam, S., & Gupta, V. (2020). Evaluation of a training program on primary eye care for an Accredited Social Health Activist (ASHA) in an urban district</p> <p>Funding: Sightsavers India</p>	<p>Health Belief Model - Inferred</p>	<p>Design: Mixed methods</p> <p>Cross-sectional: Pre- and post-assessment questionnaire</p> <p>Participatory action research: Focus group discussion</p> <p>Purpose: to bridge the gap between community and services</p>	<p>N=96</p> <p>Demos:</p> <p>Age (M): 37.5</p> <p>Gender: N.S.</p> <p>Yrs exp: N.S.</p> <p>Population: ASHA</p> <p>Setting: vision centers</p> <p>Exclusion: NS</p> <p>Attrition: 96%</p>	<p>IV: One-day training</p> <p>DV1: Reaction to training</p> <p>DV2: learning achieved, knowledge assessment</p> <p>DV3: behavior towards training</p> <p>Kirkpatrick model, one-day training program: movie on primary eye care, role plays,</p>	<p>Pre- and post-score analysis (validity and reliability not mentioned)</p> <p>Focus group discussions (40-50 min with 10-12 participants), tape-recorded and transcribed</p> <p>Re-evaluation after one year.</p>	<p>Thematic analysis</p> <p>Paired t-test</p>	<p>DV1: Training enhanced their knowledge, able to talk confidently about eye care. Gained knowledge on eye diseases (glaucoma, effects of D.M. on eyes, cataract)</p> <p>DV2: improved knowledge after training. 14.96 (before training) to 25.38 (after training).</p>	<p>LOE: V</p> <p>Strengths: Strong qualitative design, low risk</p> <p>Weakness: Low-level evidence. Possibly one day of training may not be enough.</p> <p>Conclusions: The Kirkpatrick model showed a significant increase in knowledge immediately after training and sustained for a year after training.</p> <p>Feasibility/Applicability to P.T. population:</p>

Key: AMD-age-related macular degeneration; **appt**-appointment; **ASHA**-accredited social health activist; **CAHPS**-Consumer Assessment for Healthcare Providers and Systems; **CBS**-Charles Bonnet Syndrome; **CD**-chronic disease; **CI**-confidence interval; **DM**-diabetes Mellitus; **DR**-diabetic retinopathy; **DV**-dependent variable; **DX**-diagnosis **G**-gender; **GP**-general practitioner; **HCP**-healthcare professional; **IV**- independent variable; **M**-mean; **MA**-meta-analysis; **MOOSE**-Meta-analysis of Observational Studies in Epidemiology; **N**-number of studies; **n**- number of participants; **N/A**-not applicable; **NS**-not stated; **OPT**-out-patient; **PCP**-primary care providers; **PHC**- primary healthcare; **PHS**-primary health system; **PHW**-primary health worker; **PN**-practice nurse; **POAG**-primary open-angle glaucoma; **PS**-patient satisfaction; **PSQ-18**-Patient Satisfaction Questionnaire; **PT**-patient; **PX**-prognosis; **RS**-relationship; **TX**-treatment; **UAB**-University of Alabama at Birmingham; **VAT**-vision awareness training; **VFI**-visual field index; **y.o.**-years old; **Yrs**-years; **#**-number

Citation	Theory/ Conceptual Framework	Design/Method	Sample/Setting	Major Variables Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision for practice/ application to practice/ Generalization
Country: India Bias: None noted				and module on primary eye care used for training in the hospital			$\alpha = 0.05$, $t(5) = -9.50$, $p < 0.001$ DV3: patient attendance increased by 23.6% nine months after training	Recommended for use in practice due to potential effectiveness
Voutilainen, A., Pitkääho, T., Vehviläinen-Julkunen, K., & Sherwood, P. R. (2015). Meta-analysis: Methodological confounders in measuring patient satisfaction. Funding: None Country: Multiple Bias: None noted	Social Cognitive Theory - inferred	Design: meta-analysis Purpose: To search for potential methodological confounding factors affecting the interpretation of patient satisfaction survey results	n = 355 surveys Demos: Age (M): 51 Gender: 55% female Yrs exp: N/A Population: N.S. Settings: systematic sample of P.S. surveys (between 2006 and 2012) Exclusion: if article: 1) review or MA; 2) qualitative study;	IV1: total number of P.T.s (to control the impact of study size) IV2: choice of non-response rate (has effects on P.S. survey results) IV3: P.T.'s M age (has effects on P.S. survey results) IV4: G (has effects on P.S. survey results)	Patient satisfaction survey	M.A. followed the guidelines of the MOOSE group. Linear regression Bayesian method	Linear regression model: RS between satisfaction and age ($r = 0.24$, $p < 0.01$); RS between satisfaction and item positivity ($r = 0.12$, $p < 0.05$) RS between satisfaction and # questionnaire items ($r = -0.19$, $p < 0.01$) M satisfaction lower in interview surveys (76.4 ± 0.7 ; mean \pm 95% CI)	LOE: III Strengths: Thorough explanation of methods Weakness: Time delay between care experience and publication resulted in 4.2 years. Conclusions: P.S. survey measures P.T.'s perceptions of care, and other factors are confounding variables. Bayesian model showed high P.S. (score > 78.743) could be predicted based on confounding variables.

Key: AMD-age-related macular degeneration; **appt**-appointment; **ASHA**-accredited social health activist; **CAHPS**-Consumer Assessment for Healthcare Providers and Systems; **CBS**-Charles Bonnet Syndrome; **CD**-chronic disease; **CI**-confidence interval; **DM**-diabetes Mellitus; **DR**-diabetic retinopathy; **DV**-dependent variable; **DX**-diagnosis **G**-gender; **GP**-general practitioner; **HCP**-healthcare professional; **IV**- independent variable; **M**-mean; **MA**-meta-analysis; **MOOSE**-Meta-analysis of Observational Studies in Epidemiology; **N**-number of studies; **n**- number of participants; **N/A**-not applicable; **NS**-not stated; **OPT**-out-patient; **PCP**-primary care providers; **PHC**- primary healthcare; **PHS**-primary health system; **PHW**-primary health worker; **PN**-practice nurse; **POAG**-primary open-angle glaucoma; **PS**-patient satisfaction; **PSQ-18**-Patient Satisfaction Questionnaire; **PT**-patient; **PX**-prognosis; **RS**-relationship; **TX**-treatment; **UAB**-University of Alabama at Birmingham; **VAT**-vision awareness training; **VFI**-visual field index; **y.o.**-years old; **Yrs**-years; **#**-number

Citation	Theory/ Conceptual Framework	Design/Method	Sample/Setting	Major Variables Studied/ Definitions	Measurement/ Instrumentation	Data Analysis	Findings/ Themes	Level/Quality of Evidence; Decision for practice/ application to practice/ Generalization
			3) P.S. measured using continuous scale; 4) care not given by formal HCP; 5) satisfaction did not refer to person's own experience; 6) portion of P.T.s <12 y.o. was >25%; 7)satisfaction referred only to one component of care. Attrition: 75%	IV5: Number points in the original Likert scale IV6: No of questionnaire items IV7: item positivity score IV8: interview vs. self-report survey IV9: delay between care and survey DV: patient satisfaction			compared to self-report survey (79±0.7; t-test, $t_{281} = 2.17$, $p < 0.05$) Bayesian classification model: Patient satisfaction with patient's mean age, # of items, item positivity (probability ratio 9.19%, 4.59%, 3.89%, respectively). Positive association w/mean age; negative association w/# of items; nonlinear association with item positivity	Feasibility/Applicability to P.T. population: P.S. surveys are necessary to improve the quality of care in the primary setting and the system.

Key: AMD-age-related macular degeneration; **appt**-appointment; **ASHA**-accredited social health activist; **CAHPS**-Consumer Assessment for Healthcare Providers and Systems; **CBS**-Charles Bonnet Syndrome; **CD**-chronic disease; **CI**-confidence interval; **DM**-diabetes Mellitus; **DR**-diabetic retinopathy; **DV**-dependent variable; **DX**-diagnosis **G**-gender; **GP**-general practitioner; **HCP**-healthcare professional; **IV**- independent variable; **M**-mean; **MA**-meta-analysis; **MOOSE**-Meta-analysis of Observational Studies in Epidemiology; **N**-number of studies; **n**- number of participants; **N/A**-not applicable; **NS**-not stated; **OPT**-out-patient; **PCP**-primary care providers; **PHC**- primary healthcare; **PHS**-primary health system; **PHW**-primary health worker; **PN**-practice nurse; **POAG**-primary open-angle glaucoma; **PS**-patient satisfaction; **PSQ-18**-Patient Satisfaction Questionnaire; **PT**-patient; **PX**-prognosis; **RS**-relationship; **TX**-treatment; **UAB**-University of Alabama at Birmingham; **VAT**-vision awareness training; **VFI**-visual field index; **y.o.**-years old; **Yrs**-years; **#**-number

Table A2*Synthesis table*

Author	Abdulsalam	Boxell	Dick	Ibanga	Jolley	Mafwiri	Peterson	Rotshtein	Shukla	Voutilainen
Year	2018	2017	2015	2017	2017	2016	2018	2015	2020	2015
Design/Level of Evidence	Descriptive CSS/III	CSS/III	CS/IV	Descriptive CSS/IV	CSS/IV	MMS (CS + NR)/IV	CSS/IV	CSS/V	MMS(CSS + PAP)/V	MA/IV
Demographics										
Age (M)	NS	78.3 (1999) 80.15(2013)	42	39.91	NS	NS	71.2	43	37.5	NS
Female %	27	69 (1999) 69.4 (2013)	81	53.5	50	50	57	51	NS	NS
Participants	G.P., residents, consultants in F.M.; I.M.	Macular Society members	Health & Social care professionals	Eye clinic patients	PHW	PHW	Eye clinic patients (African, European, other decent)	PCP	ASHA	NS
Setting										
Primary Care					X	X		X		
India									X	
Israel								X		
Multiple Countries										X
Nigeria	X			X						
Tanzania					X	X				
UK		X	X							
US							X			
Sample Size	110	1187 (1999) 1169 (2013)	104	398	20	60 – Trainees	110	82	96	355

Key: ASHA-accredited social health activist; **AMD**-age-related macular degeneration; **CS**-cohort study; **CSS**-cross sectional survey; **FGD**-focus group discussions; **FM**-family medicine; **GDL**-guideline; **GP**-general practitioner; **KAP**-knowledge, attitude, and practices; **IM**-internal medicine; **M**-mean; **MA**-meta analysis; **MDSQ**-Macular Disease Society Questionnaire; **MMS**-mixed method study; **NR**-narrative research; **NS**-not stated; **PAR**-participatory action research; **PCP**-primary care physicians; **PHW**-primary health worker; **PPA**-pre- and post-assessment; **PPSA**-pre- and post-score analysis; **PPTQ**-pre- and post-training questionnaire; **PS**-patient satisfaction: **PSQ**-Patient Satisfaction Questionnaire; **PSS**-patient satisfactory survey; **Pts**-patients; **QI**-questionnaire items; **SAQ**-self-administered questionnaire; **SR**-self-report; **UK**-United Kingdom; **US**-United States; **VI**-visual impairment; * - statistically significant $p \leq 0.05$; ≠ -not statistically significant; # - number; ↑-increased; ↓-decreased

Author	Abdulsalam	Boxell	Dick	Ibanga	Jolley	Mafwiri	Peterson	Rotshtein	Shukla	Voutilainen
Measurement Tools	20-item SA KAPQ	MDSQ	PPTQ	PSQ-18 adapted	Interview	20 - Interviews PPA, Interview	PSQ-18	SAQ	PPSA; FGD	PSS
Duration of Intervention (day)			1		4	4			1	
Independent Variables										
Current practice	X						X	X		
Release of GDL for AMD 2009		X								
Training			X		X	X			X	
Interview post-care				X						
# of Pts										X
Choice of non-response										X
Pts (M) age										X
Gender										X
# points in Likert scale										X
# of QI										X
Item positivity score										X
Interview vs. SR										X
Delay between care and survey										X
Dependent Variables										
Knowledge	↑	↓≠	↑*			↑			↑	
Attitude	↓							↑		

Key: ASHA-accredited social health activist; AMD-age-related macular degeneration; CS-cohort study; CSS-cross sectional survey; FGD-focus group discussions; FM-family medicine; GDL-guideline; GP-general practitioner; KAP-knowledge, attitude, and practices; IM-internal medicine; M-mean; MA-meta analysis; MDSQ-Macular Disease Society Questionnaire; MMS-mixed method study; NR-narrative research; NS-not stated; PAR-participatory action research; PCP-primary care physicians; PHW-primary health worker; PPA-pre- and post-assessment; PPSA-pre- and post-score analysis; PPTQ-pre- and post-training questionnaire; PS-patient satisfaction: PSQ-Patient Satisfaction Questionnaire; PSS-patient satisfactory survey; Pts-patients; QI-questionnaire items; SAQ-self-administered questionnaire; SR-self-report; UK-United Kingdom; US-United States; VI-visual impairment; * - statistically significant $p \leq 0.05$; ≠ -not statistically significant; # - number; ↑-increased; ↓-decreased

Author	Abdulsalam	Boxell	Dick	Ibanga	Jolley	Mafwiri	Peterson	Rotshtein	Shukla	Voutilainen
Practice	↓									
Improved experience		↑*					↑*			
Support		↓*								
Awareness of VI			↑*							
Awareness of barriers			↑*					↑		
Confidence			↑*		↑					
PS				↓ 35.8% overall		↑	↑			↑*
Referral						↑				
Communication							↑*		↑	

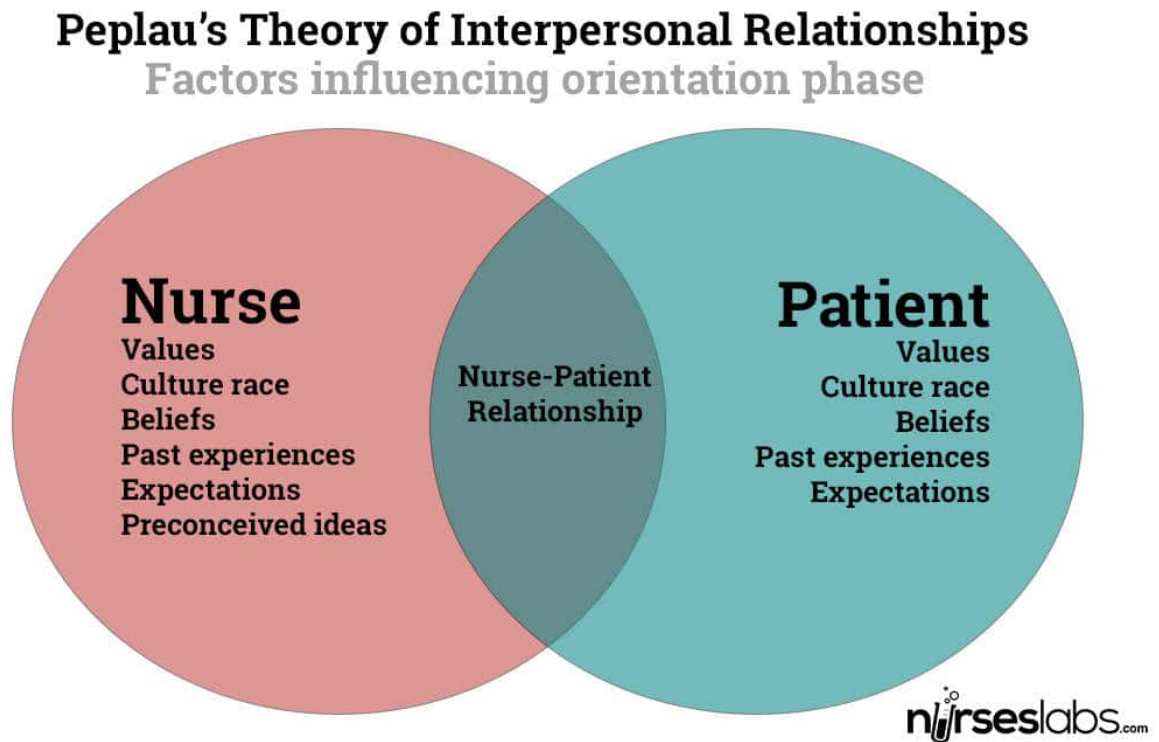
Key: ASHA-accredited social health activist; AMD-age-related macular degeneration; CS-cohort study; CSS-cross sectional survey; FGD-focus group discussions; FM-family medicine; GDL-guideline; GP-general practitioner; KAP-knowledge, attitude, and practices; IM-internal medicine; M-mean; MA-meta analysis; MDSQ-Macular Disease Society Questionnaire; MMS-mixed method study; NR-narrative research; NS-not stated; PAR-participatory action research; PCP-primary care physicians; PHW-primary health worker; PPA-pre- and post-assessment; PPSA-pre- and post-score analysis; PPTQ-pre- and post-training questionnaire; PS-patient satisfaction: PSQ-Patient Satisfaction Questionnaire; PSS-patient satisfactory survey; Pts-patients; QI-questionnaire items; SAQ-self-administered questionnaire; SR-self-report; UK-United Kingdom; US-United States; VI-visual impairment; * - statistically significant $p \leq 0.05$; ≠ -not statistically significant; # - number; ↑-increased; ↓-decreased

Appendix B

Models and Frameworks

Figure 1

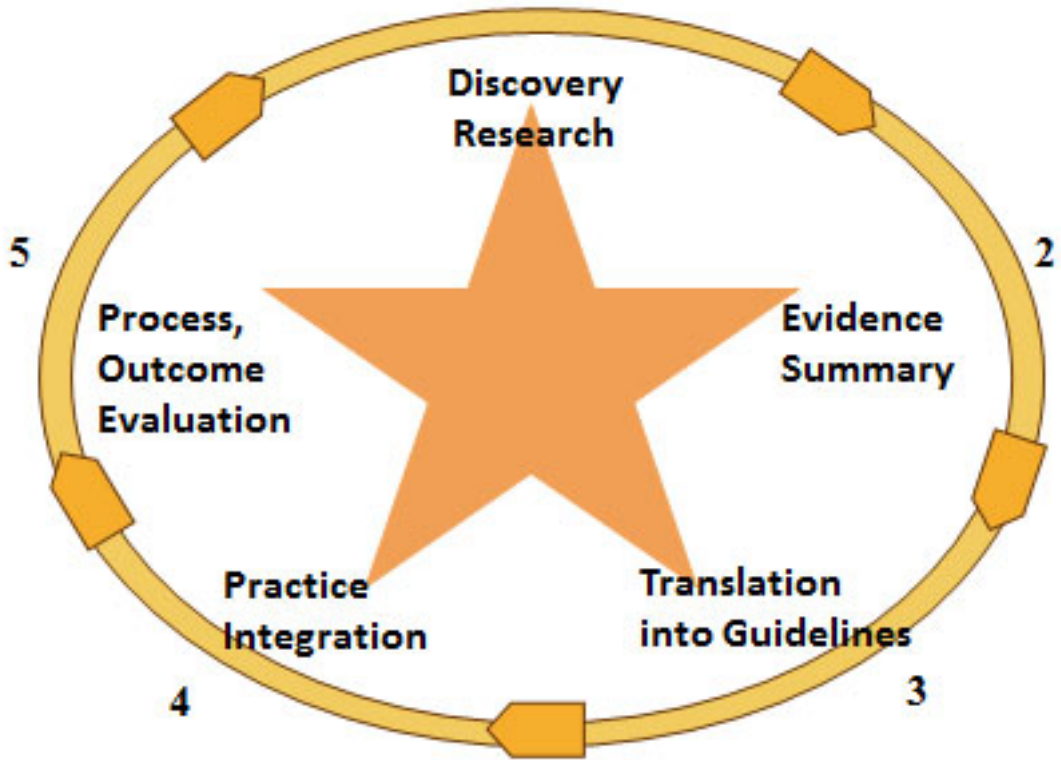
Peplau's Theory of Interpersonal Relations



Gonzalo (2019)

Figure 2

Ace Star Model of Knowledge Transformation



Stevens (2013)

Appendix C

Budget

Phase	Activities	Cost	subtotal	Total
Preparation	Design, print, and mail promotional materials to potential audiences	\$300		
	If email contact available -no cost	\$0		
	Create videos of provider presentation	\$0		
	Create members presentation	\$0		
	Design, develop and host project website with video and documents	\$0		
	Evaluation tools	\$0		
	Evaluation tools and handouts (Distribution: SurveyMonkey and link on established Organization website)	\$0		
	Organizer and volunteer time	\$0		
				\$0-300
Delivery	Zoom/Webex for “virtual training.”	\$0		
	Equipment: Ophthalmoscope	\$0 (personal equipment)		
	Equipment: Snellen eye chart	\$0 (personal equipment)		
	Equipment: dilation drops for diabetic eye exams (\$40.00)	\$0 (simulation of eye drops for presentation)		

			\$0	
Evaluation	Mail reminders to complete the survey if not done via telecommunication (100 @ \$0.55 postage; \$10 for mailing supplies)	\$65		
	If email or telecommunication is available: no cost	\$0		
	Review and analysis of results (IntellectusStatistics program)	\$0		
			\$65	\$0-365

Budget Justification

- Cost savings:
 - Since the current platform is virtual, monies saved on physical location preparation and food preparation
 - The creation of member and provider presentations would be free. PowerPoint Presentations can be created and delivered via WebEx
 - The organizational website is established, and a page can be dedicated to the project
 - Printing discount with the organization’s current printing company
 - Volunteers and organizer cost savings. Volunteered and researcher time- \$0.
- Mailing supplies: 9x12 envelopes and labels necessary to send out 100 questionnaires, stamps based on 2020 postage rates
- Potential funding:
 - Organizational fundraising, if necessary.

Appendix D

Table D1

Frequency Table for Demographics

Variable	<i>n</i>	%
SEX		
male	10	33.33
female	20	66.67
Missing	0	0.00
AGE		
46+	27	90.00
prefer not to answer	1	3.33
31-45	1	3.33
16-30	1	3.33
Missing	0	0.00
ETHNICITY		
2 or more	3	10.00
Caucasian	14	46.67
Native Hawaiian/Pacific Islander	1	3.33
Latino or Hispanic	6	20.00
African American	5	16.67
other/unknown	1	3.33
Missing	0	0.00
Eyes Affected		
Both eyes	30	100.00
Missing	0	0.00
Main Cause of Vision Loss		
Glaucoma	6	20.00
Other	10	33.33
Retinitis Pigmentosa	3	10.00
Age-related Macular Degeneration	4	13.33
Cataract	3	10.00
Diabetic Retinopathy	4	13.33
Missing	0	0.00
Visual Acuity		
Blind	20	66.67
Low vision	9	30.00
Mild Vision Loss	1	3.33

Missing	0	0.00
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Note. Due to rounding errors, percentages may not equal 100%.

Table D 2

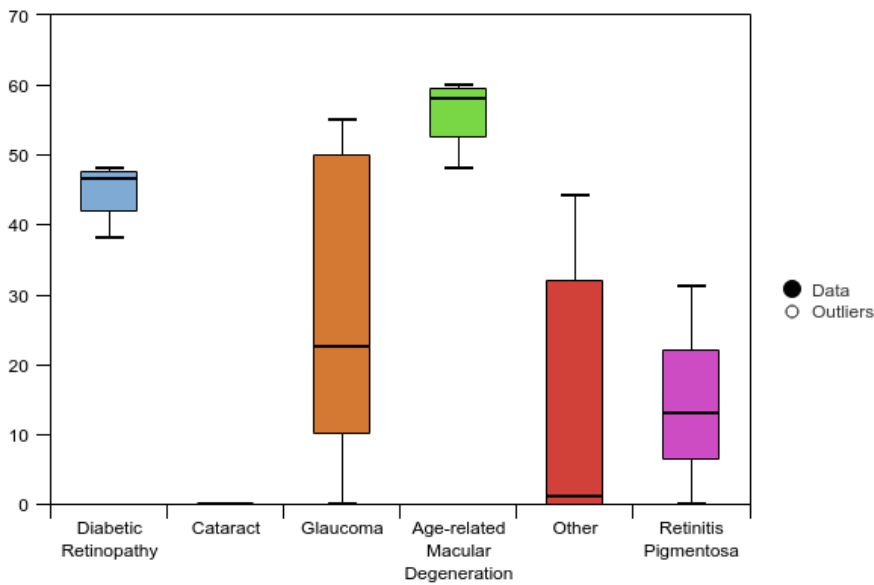
Frequency Table Main Cause of Vision Loss

Variable	<i>n</i>	%
Main Cause of Vision Loss		
Diabetic Retinopathy	4	13.33
Cataract	3	10.00
Glaucoma	6	20.00
Age-related Macular Degeneration	4	13.33
Other	10	33.33
Retinitis Pigmentosa	3	10.00
Missing	0	0.00

Note. Due to rounding errors, percentages may not equal 100%.

Figure D 3

Boxplot of Age of Diagnosis by Main Cause of Vision Loss



Appendix E

Table E1

PSQ-18 Mean Score Per Category

SATISFACTION DIMENSION	MEAN SCORE	S.D.
GENERAL SATISFACTION	2.62	0.60
TECHNICAL QUALITY	2.57	0.40
INTERPERSONAL MANNER	2.60	0.53
COMMUNICATION	2.73	0.50
FINANCIAL ASPECTS	2.75	0.57
TIME SPENT WITH THE DOCTOR	2.65	0.59
ACCESSIBILITY AND CONVENIENCE	2.44	0.52

Figure E1

Scatterplots: Sum Composite Score and the Main Cause of Vision Loss with the Regression Line

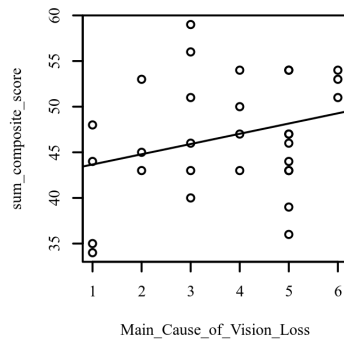


Table E1

Pearson Correlation Results Between Main Cause of Vision Loss and Sum Composite Score

Combination	r_p	95% CI	p
Main Cause of Vision Loss-Sum Composite Score	0.28	[-0.09, 0.58]	.134

Note. n = 30.

Appendix F

Table F1

Frequency Table for Nominal Variables

Variable	<i>n</i>	%
Worry about Eyesight		
All of the time	6	20.00
None of the time	10	33.33
A little of the time	6	20.00
Some of the time	6	20.00
Most of the time	2	6.67
Missing	0	0.00
General Health		
Fair	9	30.00
Very Good	9	30.00
Good	9	30.00
Excellent	1	3.33
Poor	1	3.33
Missing	1	3.33
Pain or discomfort in and around eyes		
Mild	10	33.33
Moderate	7	23.33
None	9	30.00
Very Severe	1	3.33
Severe	3	10.00
Missing	0	0.00
Eyesight using both eyes		
Poor	6	20.00
Fair	5	16.67
Completely Blind	12	40.00
Very Poor	6	20.00
Good	1	3.33
Missing	0	0.00

Note. Due to rounding errors, percentages may not equal 100%.

Figure F1

Scatterplots between General Vision and Main Cause of Vision Loss with the Regression Line

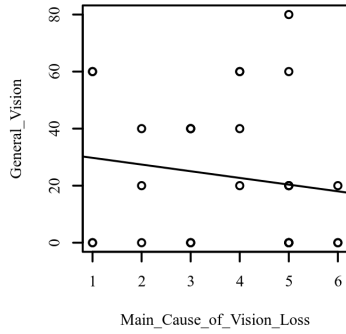


Table F2

Pearson Correlation Results Between Main Cause of Vision Loss and General Vision

Combination	r_p	95% CI	p
Mai Cause of Vision Loss-General Vision	-0.15	[-0.48, 0.22]	.434

Note. n = 30.