



An Outline of Integrating Vision Screening at a Student-Run Free Health Clinic

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Abstract

Visual impairment (VI) is a pervasive issue associated with a significant financial burden, diminished health outcomes, and an overall reduced quality of life. This condition disproportionately affects uninsured patients as they face limited access to affordable care. For this reason, FaithCare Clinic, a free, student-run clinic in Augusta, Georgia that serves uninsured and underinsured patients at least two standard deviations below the poverty line, implemented a vision screening and referral protocol to better serve its patients. Patients were approached after check-in for their appointment, but prior to seeing the physician, and were screened with a Snellen Eye Chart and Amsler Grid to assess for refractive error and other types of VI. If they screened positive, they were referred to low cost, local resources for further care. Data was collected over a period of 17 months with 47.8% of the patients seen in clinic offered vision screening. Of the patients offered screening, the majority accepted (79.1%). Half of patients screened were cleared while the other half were referred for further care. These results illustrate that patients of a free clinic are willing to undergo vision screening and can benefit from its offering due to the high rates of VI in this population. Visual disabilities are a heavy burden, especially on the uninsured and underinsured populations. Implementing vision screening in free clinics across the country can identify and facilitate additional care in an at-risk population with minimal training and few additional resources.

Introduction

Visual impairment (VI) is a pervasive issue associated with a significant financial burden, diminished health outcomes, and an overall reduced quality of life.^{1,2} Due to varying definitions of VI in the literature, a strong consensus on the rate VI in the United States (US) is lacking. Our screening protocol defined VI as corrected, binocular visual acuity worse than 20/20 or signs of macular degeneration. A population-based study using the National Health and Nutrition Examination Survey estimated that approximately 50% of the US population 12 years or older had an uncorrected visual acuity worse than 20/40.³ The largest proportion of VI is among adults aged 80 years or older, indicating increased prevalence in the aging population.⁴

The burden of VI is large and the fear of losing vision is exceedingly high.⁵ Uncorrected VIs are linked to a decrease in life expectancy and heightened feelings of isolation.^{6,7} One in four adults with vision loss also report anxiety and/or depression.⁸ Amongst older adults, visual impairments emerge as a significant risk factor for falls and injuries.^{9,10} VI is also linked to other cardiovascular risk factors such as diabetes, stroke, chronic kidney disease, hypertension, and coronary artery disease.¹¹ These conditions are not only associated with visual complications (i.e. diabetic retinopathy) but also are known to have high rates of morbidity and mortality.^{12,13} Patients who are uninsured or underinsured are already at increased risk for these comorbidities, illustrating the importance of vision screening in this population to prevent further complications of these

conditions.¹⁴

Beyond personal and social impacts, VI also predisposes patients to economic hardship, with care estimated to cost approximately \$1400 per year per individual.¹⁵ In a study of 335 patients who presented for a free ophthalmology clinic in Michigan, 22% had a VI with unemployment presenting as the most significant risk factor.¹⁶ The issue disproportionately affects uninsured patients as they face limited access to affordable care.¹⁷ Comprehensive eye exams are often not included under the umbrella of essential primary care.¹⁸ It is estimated that 7 out of 10 federally funded community health centers, serving many low-income American residents, do not staff on-site eye care professionals.¹⁹ Free health clinics are a crucial aspect of care for many patients in these circumstances, often serving as the sole point of access for receiving life-improving care.

Previous research studies have investigated the impact that student-run free clinics have on providing care for the underinsured and visually impaired population. The Kansas City Free Eye Clinic is a free clinic which provides free comprehensive eye exams and glasses to people experiencing homelessness. When asked directly, 7.5% of their patients reported that they would pay for ophthalmologic care if their free clinic did not exist, 49.6% would not pursue further care, 39.9% would find another free clinic, and 3% would go to the emergency room.²⁰ An additional study run out of a student-run free clinic in Minneapolis, Minnesota, surveyed its patients to assess the demand for specialty care. Ophthalmology was the most highly requested specialty amongst the five options provided in a survey.²¹ These findings underscore the reliance of the underinsured population on free clinics for vision care.

The aim of this work is to provide a roadmap for additional free clinics providing primary care services to begin offering vision screening to their patients. While previous literature has demonstrated the demand for ophthalmic services in a free clinic and impact of free eye care on underinsured patients, there is a lack of literature outlining the implementation process of integrating vision screening into clinic visits at a student run free clinics.

With this knowledge, student clinic coordinators at FaithCare Clinic worked to improve the

care provided for underinsured patients by integrating regular vision screening into primary care visits. FaithCare Clinic provides free primary care services to citizens of Columbia County, Georgia, with an income at least two standard deviations below the national poverty line who are uninsured or underinsured. 10.6% of Columbia County's residents under 65 are without insurance, of which FaithCare clinic sees 90 total individuals as regular patients.²² FaithCare clinic is held once a month and sees approximately 12-20 patients per clinic date. Services offered at this clinic include triage, care for chronic conditions, acute care visits, gynecological care, psychological counseling, and dental screenings. The addition of vision screening allows patients to receive this essential service in a one-stop, free clinic.

Establishing A Vision Screening Protocol

In 2021, FaithCare clinic coordinators developed a protocol to add vision screening into regular clinic visits. In order to be feasible in this setting, the protocol had to require few financial or professional resources while also providing a substantial benefit to patients.

In preparation for the screening process, coordinators compiled low-cost, accessible resources for any patients found to have VI. FaithCare coordinators partnered with a local student-run clinic that specializes in visual evaluation to provide further vision services to those who required additional care. A flyer for this ophthalmologic clinic was included on a handout provided to all patients with less than 20/20 vision on clinic screening. Three local, low-cost optometrist and ophthalmologist options were additionally located and included in the resources provided to patients with a positive screening. Finally, patients with a positive screen were given educational resources regarding refractive errors for better understanding and management of their condition. Additional information regarding handouts can be found in online appendix A.

When planning a roadmap for integration of screening into clinic, student coordinators were intentional to not delay clinic flow or add additional responsibilities to physicians and providers. Student coordinators sought additional volunteers looking for clinical experience and were

able to easily recruit pre-medical undergraduate student volunteers. Two undergraduate volunteers were educated on how to properly perform vision screening by the medical student coordinators before attending their first clinic. Medical students educated volunteers on causes, common symptoms, and treatments of refractive errors. In addition, background information on the Snellen chart and Amsler grid were taught. One undergraduate volunteer was scheduled to attend each monthly clinic. Due to the standardization of vision screening tools, volunteers of several backgrounds were able to learn and effectively implement the screening protocol, allowing for efficient clinic flow and utilization of undergraduate volunteers.

Vision Screening Within Clinic Flow

When patients presented to the clinic, they were checked in for their visit. Vitals were collected and the patient was taken to their exam room to wait for their provider visit. The vision screening initiative used this time after check-in, but prior to provider interaction, to improve care. During this window, a student volunteer entered the exam room to inquire if the patient would be interested in free vision screening before the provider was available. Patients were informed that vision screening was not a mandatory part of the visit, and if they accepted or declined, there would be no further change in their clinic appointment. If the patient agreed, they were then led through the vision screening process.

First, a 6.5 x 3.5 inch Snellen chart was used to test vision at a distance of approximately 6 feet. Each participant was instructed to read the chart as distally as possible with both eyes open, their left eye closed, and their right eye closed. Vision was recorded as the lowest line on the Snellen chart that the patient was able to correctly identify at least half of the letters. The corresponding designation of "20/___" was then recorded on a Vision Screening Phase Sheet for each eye and binocular vision (online appendix B). If participants had a vision prescription in normal use, they used their prescription for the screening in the same method as above and were indicated as "with correction". A positive screen was considered any visual acuity that was worse than "20/20" for

binocular or monocular vision.

After visual acuity testing, an Amsler grid was implemented to test for signs of macular degeneration. The grid was printed on a piece of letter paper and was approximately 5 x 5 inches in size. The patient was instructed to hold the paper at a comfortable reading distance, approximately 12-14 inches away from their face, and focus on the black dot at the center of the grid. They were instructed to close each eye one at a time while remaining focused on the center black dot. They were asked to assess their peripheral vision for any significant waving of lines, absence of boxes, or other irregularities of the grid. If these were present, the screen was considered positive. The eye that was affected and the type of irregularity was documented on the Vision Screening Phase Sheet.

Our screening protocol defined VI as corrected, binocular visual acuity worse than 20/20 or symptoms of macular degeneration. If participants screened positively on either test, the patient was referred for further care. The undergraduate volunteer would provide additional resources for further evaluation as well as educational materials. The provided resources included a flyer for a local, free clinic specializing in ophthalmic care in addition to educational information relating to refractive errors if applicable. All resources were provided in both English and Spanish. An example of patient educational materials is included in online appendix A.

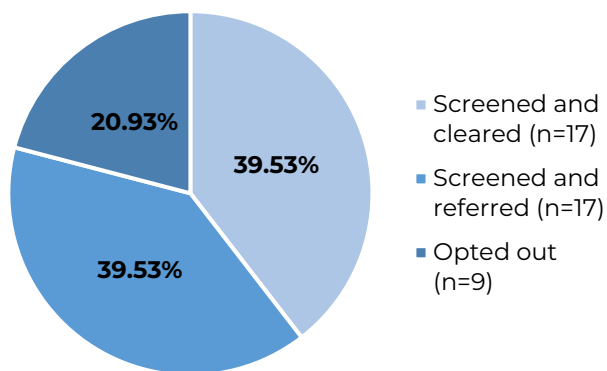
After completion of the screening protocol, the Vision Screening Phase Sheet was scanned into the patient's chart for future reference. Clinic coordinators were responsible for compiling a list of patients who required referral to the free vision clinic at each monthly clinic.

One undergraduate volunteer per clinic was responsible for vision screening and documented the outcome each time a patient was approached. The potential options for outcomes included screened and referred, screened and cleared, and denied screening. Patients were screened and referred if the patient's corrected, binocular visual acuity was worse than 20/20 or if the patient screen positively using the Amsler Grid. Patients were screened and cleared if the patient's visual acuity was equivalent to or better than 20/20 and screened negatively using the

Table 1. Vision screening outcomes

Month	Screened and cleared	Screened and referred	Opted out	Total offered screening
April 2022	0	3	2	5
May 2022	2	2	3	7
June 2022	0	2	0	2
July 2022	4	1	0	5
August 2022	0	0	0	0
September 2022	2	1	1	4
October 2022	0	0	0	0
November 2022	2	1	0	3
December 2022	1	0	0	1
January 2023	2	1	0	3
February 2023	1	0	0	1
March 2023	2	1	0	3
April 2023	1	1	1	3
May 2023	0	1	0	1
June 2023	0	1	0	1
July 2023	0	1	0	1
August 2023	0	1	2	3
Total	17	17	9	43

Figure 1. Vision screening outcomes



Amsler Grid. To document which patients had been approached for vision screening, a printed list of all new and returning patients was made available to the screening volunteer at each clinic. The list was updated after each clinic so volunteers were able to reference which patients had been screened previously and the outcome prior to approaching patients.

Outcomes

Data was collected over a period of 17 months beginning in April 2022 and continuing through August 2023 (Table 1). A total of 90 patient visits were conducted at FaithCare over this time with vision screening being offered at 43 (47.8%) of those patient visits. An average of 2.53 patients were offered screening per monthly clinic, totaling 43 patients (Table 1). Of the patients offered screening, 34 accepted (79.1%). 17 of those screened were cleared, and 17 were referred for further care (Figure 1).

Discussion

Vision impairment is a common health issue that occurs as people age.²³ Free clinics are an effective vessel for implementation of vision screening, which can require minimal training and has the potential to yield results that improve patients' quality of life. People who are uninsured or underinsured are a high-risk group for vision impairment. 34 of 43 uninsured patients (79%) who presented to our free clinic desired vision screening. Of the 34 patients, 50% were referred for further care due to abnormal screening

results. These results illustrate that patients of this free clinic were willing to undergo vision screening and benefitted from the offering of vision screening due to the high rate of VI in this population.

The rate of positive screening results in this study was slightly lower than published rates of VIs found in other US-based studies. One study conducted using the National Health and Nutrition Examination Survey (NHANES), a large US population-based survey, found that 52% of adult US survey respondents had a visual acuity worse than 20/40.³ Another study at a free eye clinic in Indiana found that 61.4% of its patients had a visual acuity of 20/40 or worse.²⁴ While only 50% of vision screenings at FaithCare resulted in a positive screening result, some of this discrepancy may be a result of corrective lenses being used in FaithCare patient evaluation if the patient previously had a prescription. This would falsely lower the referral rate when compared to studies who did not allow participants to use previous prescriptions.

Vision screening was offered at nearly half (47.8%) of FaithCare's patient visits over the study period. Of patient visits that were not offered vision screening, some were follow-up visits for patients that had been offered screening within the prior year. Some patients were not offered screening due to FaithCare volunteer time constraints. Data was not collected to quantify the reasons vision screening was not offered at every patient visit.

Limitations to this study include the small sample size due to the vision screenings' recent implementation. It was also limited by lack of follow-up data and the inability to assess the impact of referrals to the associated free vision clinic. Our study has created a window into the relationship between vision impairment and the underinsured population living in Columbia County, and we hope to further explore this relationship in future studies.

Previously published studies have explored the topic of patient follow-up after free vision screening. For example, at a free eye clinic in Indiana, 180 patients were found to have concerning ophthalmic findings and were referred to a local county hospital over the course of seven years. While follow-up care was provided, only 19.4% of

these patients pursued further follow-up care.²⁵ Another example includes a community vision screening event conducted in Pittsburgh, Pennsylvania, which reported that 48% (56 out of 117) patients referred for additional care attended their scheduled follow-up. Notably, follow-up appointments were coordinated and scheduled onsite at the time of patient screening.²⁶ Finally, a study analyzing vision screenings at urban community sites in Baltimore found rates of follow-up attendance to be 55% when patients were scheduled for follow-up appointments onsite at screening visits. These studies suggest that referrals for additional care following vision screening would ideally be scheduled at the time of vision screening if needed.

In 2021, FaithCare sought to identify an unmet need in the underinsured population of Columbia County through vision screening. An efficient and effective method of screening was developed in this clinic, which allowed a volunteer of any background to quickly learn the screening process and complete it before the provider is ready to see the patient. Along with the use of standardized tools, the recording and interpretation of screening results is seamless and allows for efficient referral to local resources.

Disclosures

The authors have no conflicts of interest to disclose.

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