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Identifying the Underserved: An Analysis of a Free Eye Clinic's Demographics

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Abstract

Background: The Kansas City Free Eye Clinic (KCFEC) is a student-run free clinic dedicated to providing comprehensive eye exams and treatment to the underserved populations of the Kansas City metropolitan area. Since the clinic's inception, volunteers have observed firsthand the great need for eye care and the impact of poor vision on health, employment, and education. As a result, services provided continue to expand, with the goal of incorporating novel communities into the treatment network. The purpose of this study was to review patient demographics in order to identify possible barriers to care and shortcomings in outreach efforts.
Methods: Medical records for patients seen at the KCFEC between December 2014 and July 2016 were reviewed for demographics including age, gender, ethnicity, housing status, and insurance status.
Results: Analysis of 334 patient records indicated that the average patient at KCFEC was a 45-year-old African American male who is uninsured and homeless. Certain groups, including females, individuals below 40 years of age, individuals above 65 years of age, and patients belonging to other minority groups, were not as prevalent at KCFEC.
Conclusions: Further investigation of potential barriers to care disproportionately experienced by these groups will be the next step in efforts to increase the clinic's impact. With the aid of periodic retrospective review of patient demographics, KCFEC aims to be a source of accessible and quality healthcare to a diverse group of patients in Kansas City.

Introduction

Barriers to Care

The effects of social determinants of health on health outcomes have been well documented in medicine. Defined by the Centers for Disease Control and Prevention as "the structural determinants and conditions in which people are born, grow, live, work, and age," these factors include education, socioeconomic status, employment, physical environment, and social support networks.[1] In the last few decades, public health research has continuously emphasized the importance of these social determinants of health, as they have been shown to exert a major influence on overall access to care, life expectancy, perinatal mortality, and quality of life. One meta-analysis of nearly 50 studies found that social factors accounted for over a third of total deaths in the United States in a year.[2] While attributing poor health to a specific factor remains difficult, research over the last several decades has consistently identified disparities in healthcare outcomes experienced by racial minorities, low-income and low-education communities, and other vulnerable groups.[2]

While these social determinants of health have had a very evident impact on overall morbidity and mortality, their impact on visual health has been less studied. Nevertheless, research does show disparities in eye care utilization in the United States.[3,4] One study analyzing the Behavioral Risk Factor Surveillance System from 2006-2009 concluded that among visually impaired adults aged 40 or older in the United States, the

prevalence of yearly eye examinations varied significantly by race, education, income, and geography.[3] Specifically, Missouri – the state in which the Kansas City Free Eye Clinic (KCFEC) is based – had the lowest prevalence of yearly eye doctor visits at 48%.[3] Another study indicated that health insurance, income, and the presence of underlying eye disease were important attributes associated with eye care usage in the United States.[4] Furthermore, an analysis of National Health and Nutrition Examination Survey and National Health Interview Survey data found that from 1999 to 2008, individuals with lower income and education levels were less likely to have accessed eye care within the past 12 months.[5] The factors influencing utilization of eye care in the United States are several, but social elements remain important contributors.

The Kansas City Free Eye Clinic

One of few student-run free eye clinics nationwide, the KCFEC was founded in 2008 to provide eye care to the underserved population of Kansas City, Missouri. Located within a 3-mile radius of the major homeless shelters of Kansas City, the clinic provides free comprehensive eye exams and eyeglasses to hundreds of low-income, uninsured, and homeless members of the community annually. Free services provided by the clinic include examinations for visual acuity, intraocular pressure measurement, and auto-refraction. Furthermore, after pupillary dilation, a volunteer optometrist or ophthalmologist examines the retina using a slit-lamp. Refractive errors are treated by providing clients with a free pair of glasses, which they can redeem on an annual basis. More complex ophthalmological conditions noted, such as proliferative retinopathy, glaucoma, and other common pathologies, are treated by referrals to partnering clinics at the Truman Medical Center and within the community.

The clinic's mission is to protect sight by increasing community awareness, uniting eye care professionals, and acting as a center for hands-on education for students interested in eye care. In addition to providing eye care on clinic days, KCFEC serves as a community for like-minded individuals, ranging from ophthalmologists to optometrists to students, to network and share ideas at social events. Furthermore, the clinic continues to partner with medical and dental clinics to ensure a healthcare continuum for the patients served.

Often overlooked, the impact of poor vision on education, employment, independence, general and mental health, and overall happiness cannot be overstated.[6-9] Several studies highlight the importance of visual health on overall quality of life, regardless of location around the world or underlying etiology of ocular morbidity.[10-12] The World Health Organization estimates that the cost of establishing and operating facilities to treat uncorrected refractive error is only a small fraction of global loss in productivity associated with that vision impairment.[13] In the 9 years since inception, KCFEC has seen hundreds of patients, both in clinic and at health fairs. In the 2017 calendar year, 304 patients were seen and 210 eyeglasses were distributed.

Nevertheless, further work remains to be done. The objective of this study is to review patient demographics in order to identify the beneficiaries of KCFEC's services and discover avenues for how to further increase the impact of the services provided. KCFEC has been serving the local community for several years and currently has the opportunity and resources to schedule more clinic days as needed.

Methods

Protocol Approvals

This study was approved by the Institutional Review Board at the University of Missouri–Kansas City and adhered to its guidelines.

Inclusion Criteria

Medical records for patients seen at the KCFEC between December 2014 and July 2016 were reviewed for demographic information gathered on patient intake forms using electronic health records (AthenaHealth, Watertown, Massachusetts). The patient information was de-identified and analyzed.

Data Collection and Statistics

Demographics of age, gender, race, housing status, and insurance status were recorded for each patient. Statistical analysis was conducted

with the use of Microsoft Excel (Microsoft Corporation, Redmond, Washington) and SPSS Statistics for Windows, version 20 (International Business Machines Corporation, Armonk, New York). Measures of central tendency were used to analyze the data set and identify demographic trends. Statistical significance was established using two-tailed t-tests and chi-squared tests with an alpha value set at 0.05.

Results

Four hundred eighty-six patient charts were gathered; 152 charts were excluded either due to incomplete information or the patient declining to be included in the study. A total of 334 patient records were examined. Patient demographics based on the retrospective analysis are outlined in Figure 1. The majority of patients (223 patients, 66.7%) were male (Figure 1A). The average age of a KCFEC patient was 45 (standard deviation = 13.4). Only 5 patients (1.50%) were above the age of 70 years old. Similarly, only 13 patients (3.87%) were under the age of 20 years old (Figure 1B). There was no significant difference between the mean ages of both males and females ($p = 0.07$).

The majority of patients identified as either Black/African American (171 patients, 51.2%) or White/Caucasian (145 patients, 43.4%). The remainder of patients identified as Asian, American Indian/Alaskan Native, or marked "Other/Prefer not to respond" (Figure 1C).

The majority of the patients reported being homeless or living in shelters (193 patients, 57.78%). Eighty-eight patients (26.35%) lived in a house or apartment. The remainder (51 patients, 15.27%) marked "Other," a category that includes living with a friend or family member or unspecified (Figure 1D). Only 25.9% of all of the homeless patients were female. There was no significant difference in overall racial breakdown of patients who reported being homeless or living in shelters ($\chi^2 = 2.36$, $p = 0.670$).

Regarding insurance status, the large majority of our patients were uninsured (229 patients, 68.56%). Twenty-seven patients reported having Medicare (8.08%) and 32 patients reported having Medicaid (9.58%). Only 21 patients (6.29%) had insurance from private sources. The remainder of patients were covered by the military (2 patients, 0.60%) or marked "Other" (20 patients, 5.99%). Within the uninsured subgroup of 229 patients, 148 patients (64.6%) were homeless, while 81 patients (35.4%) were not.

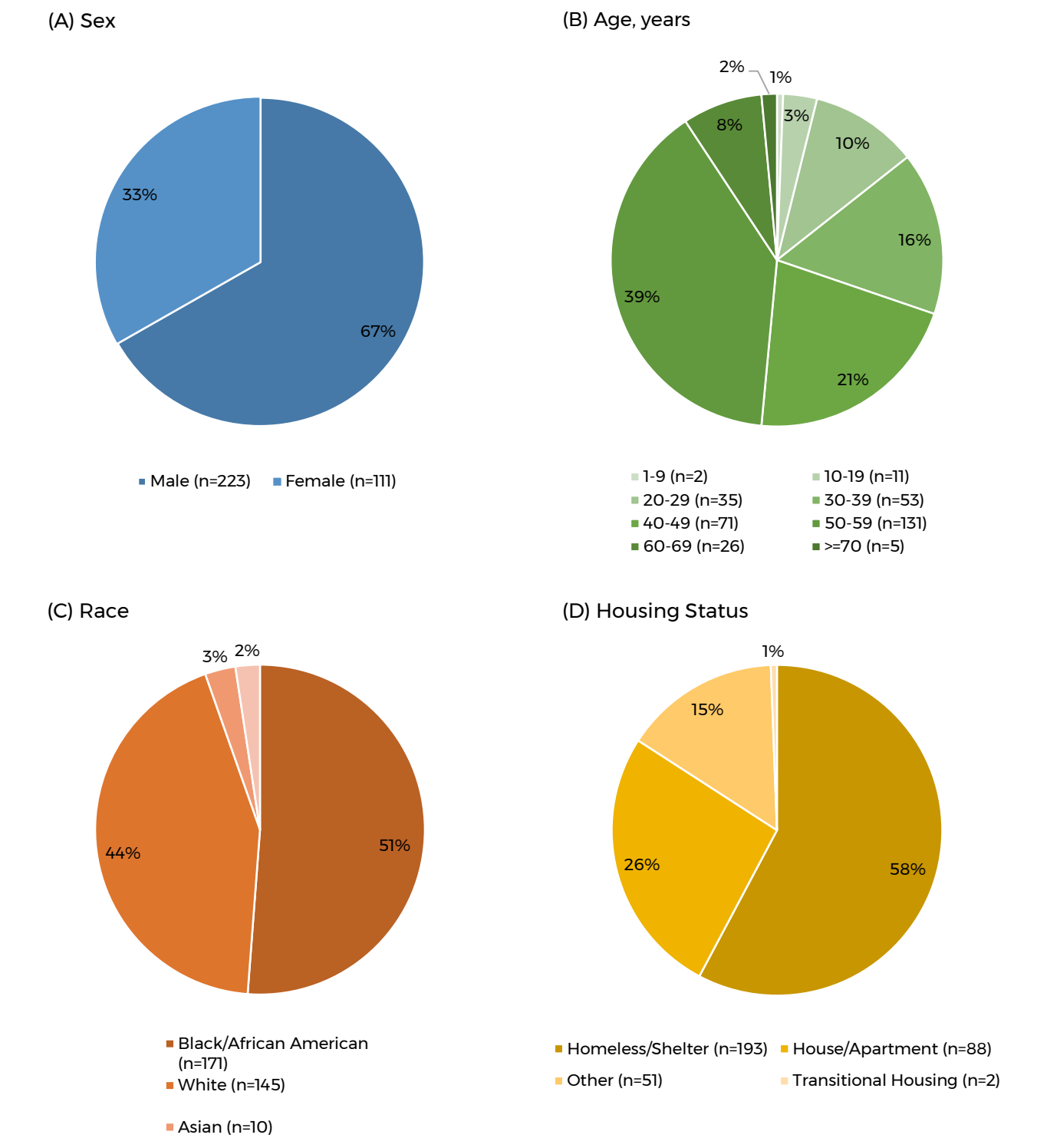
Discussion

The purpose of this study was to identify groups that had received the clinic's services over the past several years as to inform potential service and outreach expansions. Ultimately, the mission of KCFEC is to provide eye care to all populations at-need, regardless of background, age, or housing status. Our results suggested that females, individuals below 40 years of age, individuals above 65 years of age, and patients belonging to specific minority groups (other than African Americans) were less prevalent at KCFEC.

These results are not surprising; as the majority (57.78%) of KCFEC patients reside in homeless shelters, the patient population echoes the general makeup of the Kansas City homeless population. For example, the Missouri Statewide Homelessness Study Report of 2015 found that African Americans were more likely to experience homelessness than any other racial group, and compromised 60-95% of the homeless population in different shelter types.[14] Adult single males were the predominant group in emergency shelters and transitional housing.[14] People in the 31-to-50 age group were the predominant age group among all shelter types.[14] Furthermore, the Homeless Services Coalition of Greater Kansas City identified 794 persons living in emergency shelters in 2016 in Kansas City.[15] Out of these individuals, 485 were male (61.1%) and 309 (38.9%) were female; 401 (50.5%) identified as Black/African American, and 333 (41.9%) identified as White/Caucasian.[15]

The clinic's location plays a great role in this demographic observation, as KCFEC is in close proximity to several homeless shelters. The clinic has established relationships with the nearby shelters, which regularly refer their patients for vision services. The clinic's partnership with the homeless communities is rewarding by itself, as homelessness can have great implications on ocular health.[16] A German screening study suggested that homelessness itself may be a risk factor for eye disease.[16] The study found an unexpectedly high prevalence of optic nerve atrophy in home-

Figure 1. Patient Demographics



(A) The majority of patients seen in clinic were male. (B) The most common age range was 50–59 years old with most patients above 40 years old. (C) 95 percent of all sampled patients identified as Black/African American or White/Caucasian. (D) Over half of all patients reported being homeless or living in a shelter.

less people and an overall increased ocular morbidity.[16] Furthermore, a Canadian study also pointed toward a high prevalence of visual impairment and unmet eye care needs among the homeless of Toronto.[17] A large majority of participants indicated interest in accessing free eye examinations, even though many did not actively seek out services.[17] Thus, KCFEC must continue its efforts in treating the local homeless population, who may not get an opportunity to have their eyes checked until a disease has already progressed. One study that assessed how to maximize the provision of services to the homeless community noted the importance of collaboration and partnerships with other organizations, flexibility in scheduling, and ensuring affordability.[18] KCFEC strives to incorporate all of these factors to serve the homeless community. Patients may schedule an appointment on the phone or through a local agency, and several walk-in slots are available each clinic day on a first-come-first-serve basis. However, our impact with this group may be reaching its peak, as adding more clinic days has not led to a notably higher number of homeless patients.

On the other hand, with a large volunteer base and resources, KCFEC has the potential to expand its services and incorporate other at-risk groups into the treatment network. Proper eye care is lacking among the larger population in general, and it is imperative that the clinic takes initiative to reach out to neglected sectors. Studies suggest that among older Americans with diabetes and chronic eye diseases, the actual rates of eye examinations are much lower than recommended. [19-21] Almost 30% of elderly people who survive 5 years on Medicare are shown to never see an eye care provider during this time.[19-21] Among those who do see a provider at least once, most do not continue to follow up.[22] While this may not be surprising, seeing as Medicare typically does not cover routine eye exams, this finding does suggest that a large number of elderly adults do not have the opportunity to see an eye health professional on a regular basis and may benefit from services provided by KCFEC. The prevalence of poor vision and adherence to treatment among the elderly specifically has severe complications, as it has the potential to lead to physical issues, such as an increased fall risk, as well as impact their overall subjective well-being.[23] At KCFEC, out of the population sampled, only 5 of the patients (1.50%) were above 70 years old. Ideally, this number should be much higher as the elderly are more likely to see an ophthalmologist in general.[19] As such, a future goal at KCFEC is the recruitment of more elderly patients in the practice. This can be done by making community programs aware of KCFEC's services, as well as getting in touch with case managers and community leaders.

Additionally, KCFEC also sees very few young patients – only 13 patients (3.89%) in this study were under age 20. While studies suggest that up to 33% of children under 18 years old may wear corrective lenses, KCFEC's impact in this regard is very limited.[24,25] Furthermore, Kemper et al. found that only 3-9% of children between 6 and 18 years old had an eye examination within 1 year following receiving those lenses.[26] Unmistakably, regular eye care among the pediatric population continues to be a problem in the United States. While KCFEC's mission is mainly dedicated to treating adult populations, in the future, with the correct resources, the clinic can consider incorporating pediatric populations after establishing partnerships and ensuring adequate training to volunteers. We have attempted to establish "specialty clinics" where we bring select groups to our clinic for eye examinations. For example, one clinic day was held in conjunction with Central High School in Kansas City; through regular partnership we may be able to establish a steady stream of patients needing visual health services.

Last, KCFEC must also work to incorporate more patients from minority groups (other than African Americans) into our care network. Studies suggest that patients of minority backgrounds are less likely to seek medical attention for visual services.[4,27] Racial disparities in refractive error correction are especially pronounced in pediatric populations and in communities with low education and socioeconomic status.[28] While KCFEC is located in close proximity to several ethnic enclaves in Kansas City, such as neighborhoods with predominantly Hispanic, Somali, and Vietnamese populations, the patient population served remains largely African American and Caucasian. For example, in this demographic analysis, out of all 334 patients, only 10 identified as Latino/a while 10 identified as Asian. Though the lack of diversity

can be accounted for by the predominance of homeless patients from the nearby shelters (who mainly identified as Non-Hispanic Caucasian or African American), KCFEC must also improve outreach to include underserved minority groups. Achieving success with this plan involves similar steps needed to recruit elderly patients through community referrals, while also taking into account language barriers. Many of the Hispanic patients did not speak English, and their access to our services was subsequently limited based on the availability of a volunteer to serve as an interpreter. To proceed, KCFEC must be prepared with solutions to barriers such as these. For example, seeking the services of trained interpreters may help with the treatment of non-English-speaking patients. Another feasible step is the implementation of cultural sensitivity training for all student volunteers. These small steps have great potential to allow patients of all backgrounds to feel at ease and take advantage of our services.

Several barriers to care exist based on social determinants of health, including lack of awareness, lack of funds, language barriers, and transportation issues. KCFEC, with the help of its large volunteer base and many community partnerships, aims to tackle these barriers. The clinic is working to increase awareness of the importance of eye health by partnering with community organizations and holding awareness events, as well as by maintaining an active presence on social media. KCFEC works with patients who have financial difficulties by offering free eye exams and glasses for which almost all of the patients qualify. More recently, KCFEC is instituting a new program to promote visual health in patients who may have an income, but cannot afford regular eye exams. Patients who have an annual income over $40,000 per year can be seen for $20 and receive a free pair of eye glasses if needed. Moreover, KCFEC is addressing transportation barriers to care by fundraising for a new "mobile eye clinic." The clinic aims to be a mobile truck that provides eye exams and glasses by 2020. With these initiatives, KCFEC aims to increase its impact by providing quality services to a large patient network.

This project was limited by the accuracy of available chart entries and limited sample size. Only information recorded on electronic health records was included. Only 334 patient charts could be analyzed after 13 were removed for incomplete data. Moreover, 139 patients declined to be included in this study. Even so, important trends emerged from analysis of the data, which allowed us to detect gaps in the reach of KCFEC's services. The clinic hopes to use this data to set realistic goals over the upcoming year in order to continue the fight for accessible eye care services.

Conclusions

Overall, this study highlights the importance of regular retrospective studies that can help any healthcare group identify patient populations being served and recognize opportunities for expansion. KCFEC, with an abundant volunteer base and resources, has the potential to expand its services to include weekly clinics. To fill these extra slots, KCFEC can reach out to populations that have not had much exposure to its services. This includes seeing a greater number of female patients, younger and older patients, and patients from diverse racial backgrounds from nearby communities.

Disclosures

The authors have no conflicts of interest to disclose.

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