

A Survey of Eye Care Needs Among Community Health Center Patients in Western South Dakota

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Abstract

Background: Community health centers (CHCs) provide healthcare to underserved communities, including the uninsured and underinsured. Ocular disease and visual impairment affect individuals of all ages, race, and socioeconomic standing, but are disproportionately detrimental to individuals with limited access to care. The purpose of this study is to assess the need for and potential utilization of an on-site eye care clinic at a CHC in Rapid City, South Dakota.

Methods: A 22-question survey was distributed to patients 18 years and older at Community Health Center of the Black Hills (CHCBH) to gather demographic, socioeconomic, medical, and subjective interest data.

Results: A total of 421 surveys were included in the analysis. Of these, 364 respondents (87 percent) indicated being “Very likely” or “Somewhat likely” to use an on-site eye clinic at CHCBH (95 percent CI 83-90 percent). A total of 217 respondents (52 percent) endorsed a diagnosis of an existing eye condition and/or diabetes, and 215 respondents (51 percent) rated their vision as “Poor” or “Very poor.” Less than half of respondents indicated having any form of health insurance (191, 45 percent) but showed a comparably high likelihood of using an on-site eye clinic when compared to uninsured respondents, 90 percent and 84 percent, respectively. Finally, 50 (12 percent) respondents indicated being referred to an eye doctor in the past, with affordability as the most commonly cited reason for not following through with the referral.

Conclusions: Survey data indicate a medical and socioeconomic need for eye care services among CHCBH patients and a high likelihood patients would seek care at an on-site clinic.

Introduction

Vision is foundational to emotional, educational, and financial well-being. Compromised vision has social and economic implications for individuals, communities, and healthcare systems. The annual burden of vision loss in individuals under 40 is estimated to be \$38.2 billion and is significantly higher in older demographics.¹

Most causes of visual impairment are preventable and treatable.^{2,3} Routine adult eye exams help to detect ocular complications of prevalent, high morbidity diseases such as hypertension, diabetes, Graves’ disease, and multiple sclerosis.⁴ Screening in pediatric populations can reveal potentially reversible conditions such as strabismus and amblyopia.^{3,5} A 2015 screening study of children ages 6 months to 12 years in Rapid City, South Dakota, found a referral rate of 11.9 percent for ocular diseases and related risk factors.⁶

Economic, political, and geographic barriers prevent patients from accessing basic eye care services.⁷⁻⁹ Multiple studies demonstrate disproportionate rates of preventable vision loss in individuals of lower socioeconomic status and those in rural and nonwhite communities.¹⁰ In 2019, only 26 percent of privately insured individuals had access to vision care benefits, primarily through add-on, unsubsidized plans.¹¹

CHCs are federally funded outpatient facilities that function to serve the healthcare needs of the uninsured and underserved communities.¹²⁻¹⁴ To expand offerings beyond primary care, services must be made available to patients free of charge or on a sliding fee scale. Optometric services are offered by only 19-20 percent of CHC facilities.^{15,16} Those without eye care services provide off-site referrals for patients, introducing new challenges such as transportation, scheduling, and decreased Medicaid reimbursement.^{16,17} The purpose of this survey was to assess the need and potential

utilization of comprehensive eye care services by patients at CHCBH.

Methods

This multi-site, cross-sectional study consisted of a self-administered survey used to assess the importance of optometric care in CHCBH patients. The study received IRB approval from the University of South Dakota in August 2020. Prior to participation, all patients were required to provide informed consent. Data collection was conducted in accordance with the principles outlined by the Declaration of Helsinki.

Surveys were distributed to all adult patients checking in for their scheduled office visits at CHCBH and the General Beadle Community Satellite Clinic in Rapid City, South Dakota, from October 2020 through June 2021 (Figure 1). Patients who had already participated were excluded. The survey was available in English or Spanish, in “standard” or “large” font, and on paper or online via a QR code.

Figure 1. Needs assessment survey flier provided to patients when checking in for appointments.



The survey was developed by a team of University of South Dakota medical student researchers in conjunction with Northern Plains Eye Foundation and CHCBH leadership. The survey consisted of 22 questions assessing (1) basic demographics, (2) healthcare access and affordability, (3) visual and ocular health, and (4) the potential utilization of an on-site eye clinic at CHCBH (Supplemental material).

Ocular health questions were developed based upon data collected during the annual National Health Interview Survey.¹⁸ Needs assessment questions covered past medical diagnoses, subjective impression of visual quality, and limitations attributed to poor eyesight. Questions about past optometric referrals, accessibility of optometric services, and the likelihood of using an affordable eye clinic were used to gauge demand. No formal measurements of validity or reliability were performed due to the custom nature of the survey.

A single author collected and consolidated paper and online responses for data analysis. All surveys with complete demographic information and at least one additional response were considered eligible. Respondents were stratified by demographic, economic, and health metrics. A high-risk sub-population was established based on the definition by Zhang et al. This included patients that (1) were 65 years or older, (2) self-reported a diagnosis of diabetes, or (3) self-reported having an ocular disease or condition such as age-related macular degeneration, cataract, diabetic retinopathy, glaucoma, or eye injury.²

Statistical Analysis

Analysis was performed using Microsoft Excel for Windows 10 Pro (v. 21H1, Microsoft Corporation). Comparison of survey responses with 2020 CHCBH data was performed using chi-square test of independence. A p-value less than 0.05 was considered significant. A 95 percent confidence interval was calculated for key statistics.

Results

A total of 421 eligible surveys were submitted by patients over the nine-month period. The number of ineligible surveys was negligible (estimated as fewer than five). The majority of respondents identified as White or Caucasian (344, 82 percent) followed by American Indian or Alaskan Native (32, 8 percent). Race data was not available for 10 percent of CHCBH patients, which showed a smaller proportion of white patients (75 percent, $p < 0.01$) but comparable proportions of American Indian/Alaskan Native (8 percent) and Hispanic/Latino (6 percent) patients ($p = 0.78$ and $p = 0.68$, respectively). CHCBH data for patient age was comparable to survey results, with the majority between the ages 18 to 44 ($p = 0.45$) (Table 1).

While a comparable proportion of white and non-white respondents endorsed an eye condition (40 percent and 35 percent, respectively; $p = 0.41$), a significantly larger proportion of non-white respondents endorsed having diabetes (36

percent and 20 percent, respectively; $p < 0.01$). Approximately 75 percent of both white and non-white respondents said they were “Very likely” to use an eye clinic at CHCBH.

Regarding employment and income, 208 (49 percent) respondents indicated they were employed, 103 (25 percent) unemployed, and 54 (13 percent) “Unable to work.” Survey respondents unable to work indicated the strongest interest in eye care services, with 94 percent (51) responding “Very likely” or “Somewhat likely” to use an eye clinic at CHCBH compared with 82 percent (171) of employed respondents. The majority of respondents (354, 84 percent) reported annual take-home income of \$50,000 or less, most frequently between \$10,001 and \$30,000 (40 percent). Respondents with income of \$10,000 or below indicated the highest likelihood of utilizing an eye clinic at CHCBH (101, 83 percent).

Over half of survey respondents (230, 55 percent) indicated no insurance, while CHCBH data indicated only 43 percent of patients were uninsured ($p < 0.01$). Of uninsured respondents, 50 percent reported they had never had an eye exam or that it had been longer than two years since their last eye exam, as compared to only 29 percent of those with insurance. Of those without insurance, 90 percent said they were somewhat or very likely to use an eye clinic at CHCBH, compared to 83 percent of those with insurance ($p = 0.04$).

The majority of respondents rated their eyesight as “Poor” (178, 42 percent) or “Very poor” (37, 9 percent). Over half (219, 52 percent) indicated a need for new corrective lenses in the last year, but 147 (67 percent) of these indicated they could not afford corrective lenses. Of all respondents, 164 (39 percent) endorsed a history of an eye condition(s) (Table 3). Of those with previous or existing eye disease, 56 percent reported daily limitations due to eyesight. Over one-third of all respondents (150, 36 percent) met the criteria for being at high-risk of vision loss.

Only 25 (6 percent) respondents indicated they had never been examined by an eye

doctor, while 50 (12 percent) reported they had been previously referred to an eye doctor from their CHCBH provider. Regarding prior referrals, only 23 (46 percent) indicated they attended their appointment. Of those that did not schedule or attend the referred appointment, affordability was the most commonly cited reason (14, 52 percent).

Of all 421 respondents, 364 (87 percent) said they were “Very

Table 1. Characteristics of adults 18 years or older depicted by the needs assessment survey and 2020 CHCBH patient demographic data.

Variable	Needs assessment survey respondents (n= 421)	CHCBH 2020 demographic data (n= 6,498)	p-value ^a
Sex			<0.01
Male	28%	42%	
Female	71%	58%	
Prefer not to say	1%	NA	
Age, y			
18-44	54%	52%	0.45
45-64	38%	35%	0.10
≥65	8%	13%	<0.01
Race/ethnicity			
White or Caucasian	82%	75%	<0.01
American Indian or Alaskan Native	8%	8%	0.78
Hispanic or Latino	6%	6%	0.68
Unreported	NA	10%	-
Other ^b	4%	1%	-
Employment status			
Employed	49%	28%	<0.01
Unemployed	25%	24%	0.91
Unable to work/disabled	13%	6%	<0.01
Other ^c	13%	9%	0.01
Unknown	NA	33%	-
Income			
\$10,000 and below	29%	51%	<0.01
\$10,001 - \$50,000	55%	14%	<0.01
\$50,001 and above	8%	2%	<0.01
Unknown / Unreported	8%	33%	<0.01

^a calculated using Chi-square test of independence

^b Asian, Black or African American, Hawaiian or Pacific Islander, more than one race, or “Other”

^c Retired, Student, or “Other”

Table 2. Health insurance data from needs assessment survey respondents and 2020 CHCBH patient demographic data.

Variable	Needs assessment survey respondents (n=421)	CHCBH 2020 demographic data (n=6,498)	p-value ^a
Insurance			<0.01
None /uninsured	55%	43%	
Insured	45%	57%	
Insurance type	(n=191) ^b	(n=3,736)	<0.01
Private	42%	54%	
Medicare	25%	24%	
Medicaid	38%	18%	
Other ^c	12%	4%	

^a calculated using chi-squared analysis

^b The needs assessment survey permitted multiple responses to the health insurance inquiry from a single respondent. Of the 191 respondents that indicated some form of health insurance, 230 total responses were recorded.

^c State Children's Health Insurance Program (CHIP), Indian Health Service, Military, Other public or government, Other non-federal

Table 3. Existing eye disease, diabetes, and subjective eyesight and limitations among needs assessment survey respondents.

Variable	Needs assessment survey respondents (%)
<u>Existing ocular disease or previous injury^a</u>	
Yes	164 (39)
No / Unknown	257 (61)
<u>Diagnosis of diabetes</u>	
Yes	97 (23)
No / unknown	324 (77)
<u>Family history of blindness</u>	
Yes	96 (23)
No / unknown	325 (77)
<u>Subjective evaluation of eyesight</u>	
"Good" or "Very Good"	202 (48)
"Poor" or "Very Poor"	215 (51)
Did not respond	4 (1)
<u>Subjective eyesight limitations</u>	
Yes	194 (46)
No	223 (53)
Did not respond	4 (1)

^a Includes cataracts, diabetic retinopathy, eye injury, glaucoma, macular degeneration, refractive error, or "Other"

Table 4. Reported affordability and accessibility of eye care among needs assessment survey respondents.

Variable	Needs assessment survey respondents (%)
<u>Self-reported need for corrective lenses</u>	
Yes	219 (52)
No	138 (33)
Unknown / did not respond	64 (15)
<u>Affordability of corrective lenses</u>	
Yes	73 (17)
No	154 (37)
Not applicable / did not respond	194 (46)
<u>Last eye exam by an eye doctor</u>	
Less than 1 year ago	111 (26)
Between 1 and 2 years ago	137 (33)
Greater than 2 years ago	146 (35)
Never	25 (6)
Did not respond	2 (<1)
<u>Previous CHCBH referral to an eye care professional</u>	
Yes	50 (12)
Attended	23 (46)
Did not attend ^a	27 (54)
No	348 (83)
Unknown / did not respond	23 (5)
<u>Primary reason for not attending/scheduling appointment per se</u>	
Could not afford	14 (52)
Could not secure transportation	1 (4)
Skipped	4 (15)
Other or did not respond	8 (29)

^a Includes "Did not schedule an appointment" and "Scheduled appointment but did not attend"

likely" or "Somewhat likely" to use an eye clinic at CHCBH (95 percent CI: 83-90 percent), with personal eye exams and obtaining corrective lenses as the most likely services they would use. One-third of respondents (144, 34 percent) reported they would utilize a community-based eye clinic for their childrens' eye exams. Of these, nearly half (47 percent) indicated they had no insurance, and a quarter (24 percent) reported an annual take-home income of \$10,000 or less. Only 27 (6 percent) respondents indicated they were "Somewhat unlikely" or "Very unlikely" to use an on-site eye clinic at CHCBH. Only 13 (3 percent) indicated they would not use an on-site eye clinic at CHCBH (Figure 2).

Discussion

Survey respondents indicated a need for eye care services consistent with the needs of underserved populations in the U.S. Over half reported dissatisfaction with their vision, and a comparable number reported limitations in their activities of daily living due to eyesight. Over one-third endorsed a diagnosis of an eye condition, and over a third were considered at high risk for vision loss. Only a third of survey respondents with diabetes reported an eye exam in the previous year, despite the American Diabetes Association's recommendation for an annual eye exam.¹⁹ Two-thirds of those who indicated a need for corrective lenses said they could not afford them, and over half of those with a prior referral from CHCBH to an eye doctor said they did not go because they could not afford the appointment.

Survey respondents indicated an existing demand for eye care services at CHCBH. Respondents endorsing some form of health insurance, employment, and comparatively higher income indicated a strong likelihood of utilizing an on-site eye clinic. Respondents reporting having seen an eye doctor in the last year indicated a strong likelihood of using an eye clinic. Because CHCBH does not yet offer on-site eye exams, this suggests a potential preference of these respondents for receiving eye care from CHCBH, perhaps for the convenience of comprehensive care at a single location or the affordability of CHCBH services. Respondents that reported never having seen an

Figure 2a. Likelihood of utilizing an on-site eye care clinic at CHCBH among needs assessment survey respondents.

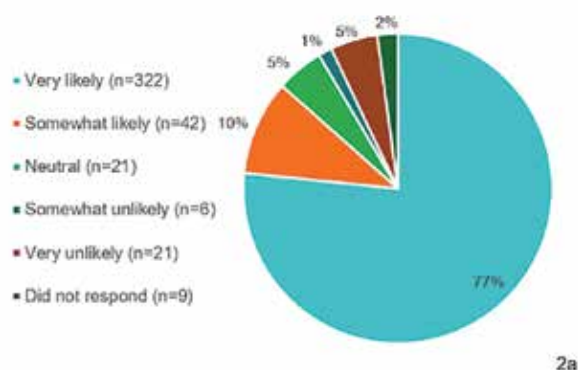
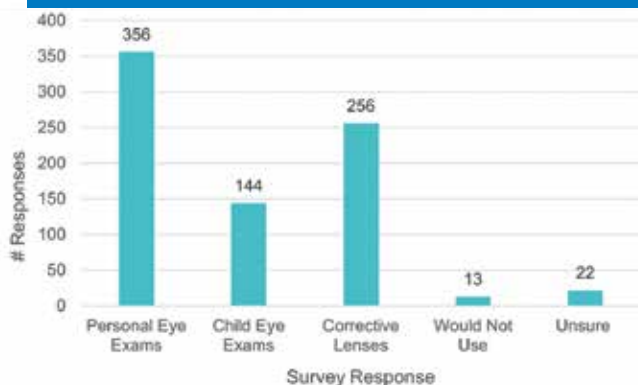


Figure 2b. Preferred services at potential eye care clinic at CHCBH among needs assessment survey respondents.



eye doctor also endorsed a high likelihood of using eye services if made available. Given these respondents were more likely than not to be uninsured, it's possible that insurance, rather than interest, is the primary deterrent to these patients receiving eye care services. Finally, the survey likely underestimates the potential utilization of visual health services for children if they were made available at CHCBH. Children and adolescents comprised an estimated 33 percent of CHCBH patients in South Dakota in 2019; however, individuals under the age of 18 were excluded from the needs survey.²⁰

Given the well-established relationship among literacy, employment, and socioeconomic status, lower income individuals are perhaps less likely to be able to complete a written survey. This could explain why a significantly larger proportion of survey respondents endorsed being employed and in higher income brackets compared to the CHCBH data. Similarly, patients with eye disease or impaired vision are perhaps more likely to engage with a survey inviting them to discuss eye care needs than those without pertinent

concerns. Conversely, a survey only offered in print or online may have limited participation from those with vision loss. Uninsured/underinsured patients are perhaps more motivated to encourage expansion of medical services that cannot be obtained elsewhere in comparison to their insured counterparts. A majority of insured patients still indicated they would utilize the services of an eye clinic if it were available at CHCBH.

This survey demonstrates that CHCBH patients have a need for eye care services and a high likelihood of using an on-site clinic provided through the existing physical and financial framework of CHCBH. Socioeconomic findings of the survey indicate a CHC is appropriate for providing these services. Expansion of the CHCBH's services to include an eye clinic is supported by the survey findings and warrants serious consideration.

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