Reduced visits to pediatric eye care among socioeconomically disadvantaged patients during the COVID-19 pandemic

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We hypothesized that children with low socioeconomic status (SES) had disproportionately fewer eye care visits during the early COVID-19 pandemic and that these children would be less likely to use synchronous provider-to-patient telemedicine eye care visits. This study investigated changes in patient demographics at a large, academic pediatric eye center before and after the pandemic. A retrospective review of all visits from March 18, 2019, to May 31, 2019 (pre-COVID period) and of the same date range in 2020 (COVID period) was performed. Patient addresses were used to calculate the Area Deprivation Index (ADI), a validated measure of a neighborhood's SES. Patients who identified as non-White, and those requiring an interpreter had relatively fewer visits during the COVID period compared to the pre-COVID period. In addition, relatively fewer telemedicine visits were performed with patients who lived in a neighborhood classified as at or above the 50th ADI percentile (more disadvantaged).

T he prevalence of eye disease is higher among children with low socioeconomic status (SES), yet they are less likely to see eye specialists.[1-4] In the United States, the COVID-19 pandemic has disproportionately affected people with lower SES in terms of morbidity and mortality from the virus,[5-7] and early evidence has suggested that vulnerable populations disproportionately lost access to care following the widespread implementation of telemedicine.[8,9] This study examined how the pandemic affected visits to pediatric eye care for children with low SES.

Methods

This was a retrospective chart review using billing data for all visits completed in the Department of Ophthalmology at Boston Children's Hospital from March 18 to May 31, 2019 (pre-COVID period), and for the same date range in 2020 (COVID period). This study was approved by the Boston Children's Hospital Institutional Review Board and was performed in compliance with the US Health Insurance Portability and Accountability Act of 1996. The following patient data were collected: age, sex, address, self-identified race, insurance, whether an interpreter was listed as needed for each visit, and whether the visit was performed via synchronous provider-to-patient telemedicine. Area Deprivation Index (ADI), which is a validated measure of neighborhood SES that takes into account 17 different social measures across income, education, housing, and employment domains, was calculated based on home addresses.[10] Socioeconomic disadvantage was defined as any of the following: (1) self-identified race not "White"; (2) having any public insurance, regardless if primary or not; (3) interpreter status listed as needed in the scheduling software; (4) patient address corresponding to an ADI ≥50th percentile nationally.

The primary outcome was a statistical comparison of visits that were for socioeconomically disadvantaged children (by definitions above) seen in the COVID period compared to the pre-COVID period. This was performed using Pearson χ^2 tests. The secondary outcome was a statistical comparison of in-person as well as telehealth visits during the COVID period compared with the total pre-COVID visits for each category. The secondary outcome was also assessed using Pearson χ^2 tests.

Results

In the pre-COVID period, there were 9,793 visits, with 27 (0.3%) conducted by telehealth. Median patient age in the pre-COVID period was 7.8 years. In the COVID period, there were 4,240 visits, with 2,939 (69.3%) conducted by telehealth; median age was 6.6 years.

For the primary outcome, visits were disproportionately decreased in the COVID period compared with the pre-COVID period among those who self-identified as non-White and those requiring an interpreter. In contrast, there was no significant decrease in the relative proportion of overall visits between the pre-COVID and COVID period among those patients with public insurance or high ADI (low SES). See Table 1.

With regard to the secondary outcome, the distribution of telehealth and in-person visits during the COVID period, similar decreases were seen for both in-person and telemedicine visits in the proportion of visits that were for non-White patients and those requiring an interpreter.

There was also underrepresentation of patients with a high ADI (low SES) in telehealth visits, even though there was no underrepresentation for this group in overall visits during the COVID period. There was no significant change in distribution of visits for either telehealth or

Table 1. Visits in Pre-COVID and COVID periods by race, interpreter need, and Area Deprivation Index (ADI)

	Pre-COVID total visits (%)	COVID total visits (%)	P value[a]	COVID in-person visits (%)	P value[a]	COVID telehealth visits (%)	P value[a]
Race[b]							
White	4243 (63)	1779 (68)	<0.0001	525 (70)	0.0002	1254 (68)	0.0006
Non-White	2464 (37)	824 (32)		222 (30)		602 (32)	
Insurance[c]							
Private	5391 (55)	2380 (56)	0.2362	716 (55)	0.9919	1664 (57)	0.1336
Public	4402 (45)	1860 (44)		585 (45)		1275 (43)	
Interpreter status[d]							
No interpreter needed	8650 (90)	3902 (93)	<0.0001	1190 (92)	0.0381	2712 (93)	<0.0001
Interpreter needed	945 (10)	299 (7)		104 (8)		195 (7)	
ADI[e]							
High socioeconomic status	7171 (92)	3221 (92)	0.5787	970 (90)	0.0208	2251 (93)	0.0278
Low socioeconomic status	652 (8)	281 (8)		113 (10)		168 (7)	

[a]P values compare to pre-COVID total visits.
[b]Missing data for race is 32% for pre-COVID period and 39% for COVID period.
[c]No missing data for insurance category.
[d]Missing data for interpreter status is 2% for pre-COVID period and 1% for COVID period.
[e]Missing data for ADI is 20% for pre-COVID period and 17% for COVID period.

in-person visits according to insurance type, compared with the pre-COVID distribution (Table 1).

Discussion

Patients requiring an interpreter and who self-identified as non-White made up a smaller percentage of visits during the COVID-19 pandemic compared to pre-pandemic visits at a large, academic pediatric eye center in the United States. Because our study examined completed visits exclusively, it is unknown whether the affected patients were either unable to access care or chose to forgo care because of concerns of COVID exposure, financial burden, or other reasons.

Additionally, we observed decreased utilization of telehealth visits in particular among patients living in more deprived neighborhoods as measured by ADI, non-White patients and patients requiring an interpreter. There was no decrease in relative number of overall visits for high ADI (low SES) patients during the COVID period, suggesting there may be barriers specific to telehealth. Low-income individuals are less likely to own smartphones, have home broadband, and use the internet.[11]

The limitations of our study primarily pertain to the quality of the demographic data available. Although missing data for interpreter and insurance status was small, there was a large percentage of missing data for ADI (20% in the pre-COVID period and 17% in the COVID period) and race (32% in the pre-COVID period and 39% in the COVID period).

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