Registry of Efficacy and Effectiveness Studies

Study Title:

Evaluation of Vision for Baltimore

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Section I: General Study Information

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Study Start Date:

2016-08-26

Study End Date:

2020-01-31

Intervention Start Date:

2018-11-01

Timing of entry:

Prior to collection of outcome data

Brief Abstract:

Vision for Baltimore is a citywide program to expand school-based vision care and provide glasses to students who need them. It is a partnership between the Baltimore City Public School Systems, the Baltimore City Health Department, Vision to Learn, Warby Parker, and Johns Hopkins University. Researchers at Johns Hopkins University will evaluate the impacts of the school-based vision care program on students' academic and engagement outcomes.

Keywords:

School-based health, School-based vision, Randomized controlled trial, Research-practice partnerships, Program evaluation, Reading achievement

Comments:

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Section II starts on the next page.

Section II: Description of Study

Type of Intervention:
School-based vision care

Topic Area of Intervention:
School-based vision care

Number of intervention arms:
2

Target school level:
1, 2, 3, 4, 5, 6, 7, 8, Kindergarten

Target school type:
Urban

Location of Implementation:
United States : South

Further description of location:
Baltimore, Maryland

Brief Description of Intervention Arm 1:
Beginning in the fall of 2016, the Baltimore Health Department expanded school-based vision screening to all students in Baltimore City Public Schools in grades K through 8. Students who failed these initial screenings were then referred for vision exams, which were conducted by Vision to Learn. Students who failed the screenings received a vision exam only if they returned a sign consent form. To conduct the vision exams, Vision to Learn transported its Mobile Clinic to individual schools. If students were found to need eyeglasses, Vision to Learn also measured students to determine appropriate eyeglass size. Eyeglasses were ordered for students who needed them, and Warby Parker fulfilled the orders. Eyeglasses were then transported to individual schools for specific students. The intervention also included the help of school vision advocates, who were project personnel employed by Johns Hopkins University and who visited schools to raise awareness of the vision program and to assist in the logistic details of the program (e.g, obtaining parental or guardian consents for students to receive the vision exams). Baltimore City Public Schools also served as a project partner and assisted in pushing out communications to principals about the school-based vision program.

Brief Description of Intervention Arm 2:

Brief Description of Comparison Condition:
Business-as-usual. The Baltimore Health Department routinely conducts vision screens for all children in preschool or kindergarten (or upon entry to district) and in the first and eighth grades. No other vision supports were provided to students in comparison schools.

Comparison condition:
Business-as-usual

Comments:

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Section III: Research Questions

Confirmatory research questions:

Question 1:

What is the effect of providing eyeglasses and a school-based intervention to promote eyeglass usage on student growth in reading and mathematics for students in grades 3-8 with refractive errors (myopia, hyperopia, astigmatism)?

Exploratory research questions:

Question 1:

What is the effect of providing eyeglasses and a school-based intervention to promote eyeglass usage on variables beyond achievement, such as attendance, for students with refractive errors?

Question 2:

How do program effects vary for students with different types and severities of refractive error? How do they vary for students with high, average, or low reading achievement at baseline? For boys and girls?

Question 3:

What is the effect of providing eyeglasses and a school-based intervention to promote eyeglass usage on student growth in reading and mathematics on formative assessments (e.g., iReady) for students with refractive errors in grades K-2?

Comments:

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Section IV-A: Study Design (Selection)

Study Design:

Randomized Trial (RT)

Comments:

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Section IV-B: Study Design (Input)

Study Design: Input

Unit of random assignment of intervention:

School

Assignment within sites or blocks:

Yes

Define the sites or blocks:

School Type, Charter Status, Pilot School Status, Demographics

Probability of assignment to treatment the same across sites or blocks:

No

Probability of assignment to treatment:

Schools were randomly assigned into three groups. The first cohort received the intervention for 1+ school years. The second cohort received the intervention for <1 school year. The third cohort is the comparison group. There was a 33% chance that schools were assigned to each group. However, given that two of the randomized groups received the treatment, the probability of assignment to treatment across all cohorts was 2/3.

Unit outcome data measured:

Student

Intermediate clusters between unit of random assignment and unit of measurement:

No

Comments:

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Design Classification

Based on the responses above, this study has been classified as:

RT: Multisite (Blocked) Cluster Randomized Trial

Section V: Sample Characteristics

Approximate number of students per school: 40

Approximate number of schools in the comparision condition within each block (School Type, Charter Status, Pilot School Status, Demographics): 4.6

Approximate number of schools in the intervention condition within each block (School Type, Charter Status, Pilot School Status, Demographics)1: 4.8

Approximate number of schools in the intervention condition within each block (School Type, Charter Status, Pilot School Status, Demographics)2: 4.4

Number of blocks (School Type, Charter Status, Pilot School Status, Demographics): 9

Were there certain students that were targeted for the study?

Yes - Students who (a) failed initial vision screenings; (b) underwent more comprehensive vision exams; (c) were diagnosed with a refractive error and were prescribed eyeglasses; and (d) were not diagnosed with non-refractive ocular pathology (a more serious condition).

Were there certain students that were excluded from the study?

Yes - Students who did not meet the study criteria (see above).

Were there certain schools that were targeted for the study?

Yes - Non-alternative elementary and middle schools in Baltimore City Public Schools

Were there certain schools that were excluded from the study?

Yes - Hampstead Hill was excluded from the study because the school received the intervention prior to randomization. The school was randomly assigned at the onset of the study, but should have been excluded from the sample of study schools.

Were there certain blocks (School Type, Charter Status, Pilot School Status, Demographics) that were targeted for the study?

No

Were there certain blocks (School Type, Charter Status, Pilot School Status, Demographics) that were excluded from the study?

No

Comments:

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Section VI: Outcomes (Input)

Confirmatory question 1: Outcome Measure 1
Outcome domain: Student Achievement - Literacy

Minimum detectable effect size: 0.148

Outcome measure: PARCC ELA

Scale of outcome measure: Continuous

Normed or state test: Yes

Same outcome measure in treatment and comparison groups: Yes

Confirmatory question 1: Outcome Measure 2
Outcome domain: Student Achievement - Literacy

Minimum detectable effect size: 0.148

Outcome measure: PARCC Math

Scale of outcome measure: Continuous

Normed or state test: Yes

Same outcome measure in treatment and comparison groups: Yes

Section VII: Outcomes (Input)

Baseline data collected prior to start of intervention:

Yes

Description of baseline data:

Baseline data will include students' PARCC scores from prior years. Because PARCC is administered only for students in grades 3-8, other available pretest data, such as students' iReady scores, will be used as the pretest for students in grade 3.

Covariates you plan to include in the model:

English Language Learner Status, Free and Reduced Lunch Status, Gender, Grade, Race, Special Education Status,

Student Pretest

Covariates you plan to include in the model:

School-level blocking variables.

Analytic model:

To address the confirmatory research question, we will use hierarchical linear modeling (HLM) to estimate the impact of school-based vision services on students' achievement in reading and mathematics. HLM accounts for the fact that students are clustered within schools. We will estimate differences in spring achievement for students in schools that have received vision services and for students in control schools. We will also account for students' achievement prior to any vision services by including a pretest as a covariate in the models. The models will also include student grade level at the time of school random assignment and school-level blocking variables or covariates used in the random assignment process.

Plan to handle cases with missing outcome data:

Delete cases with missing data for the outcome being analyzed

Planned multiple comparisons adjustment, confirmatory question 1 :

No

Comments:

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Section VIII: Additional Information

Links:

https://health.baltimorecity.gov/VisionForBaltimore

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https://www.hopkinsmedicine.org/wilmer/research/dana-center/research/breds/vision-for-baltimore.html

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http://archive.education.jhu.edu/research/crre/index.html

Files:

No Files have been added yet.

Comments:

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Vision for Baltimore Analytic Plan

Design and purpose of the study

The purpose of this study is to estimate the one- and two-year impacts of V4B's school-based vision services, including provision of eyeglasses to students who needed them, on student achievement in English language arts (herein referred to as reading) and mathematics. The study design is a cluster randomized controlled trial where elementary and middle schools will be randomly assigned to one of three treatment conditions: treatment in the first school year (SY) of the study (SY 2016-17), treatment in the second SY of the study (SY 2017-18), or delayed treatment. Students in the delayed treatment group will serve as the control group, and they will ultimately receive vision services in the SY 2018-19.

Comparisons

The primary study outcome is the 1-year intervention impact, measured by the effect size (ES) comparing Cohort 1 (intervention) versus Cohorts 2 and 3 (control) at the end of the first program year (SY 2016-17) and comparing Cohort 2 (intervention) versus Cohort 3 (control) at the end of the second program year (SY 2017-18). The secondary outcome is the 2-year intervention impact, measured by comparing Cohort 1 (intervention) versus Cohort 3 (control) at the end of the second program year (SY 2017-18).

Analytic sample

Students will be included in the analytic sample if they failed vision screening, completed the eye examination, and opted into the study. Students will be excluded for any of the following: (1) eyeglasses not prescribed; (2) did not have baseline standardized test scores prior to program implementation or post-intervention scores on any test; (3) were not in 3rd-7th grades when they received intervention. We plan to use an intent-to-treat approach in which students will remain in their initially assigned treatment condition regardless of whether they transfer to another school in the study with a different treatment condition.

Baseline equivalence

Demographics and baseline characteristics will be summarized by cohort and treatment condition. Continuous variables will be summarized with descriptive statistics (N, mean, standard deviation [SD]). Categorical variables will be summarized with frequency and percentage.

School-level. Baseline school characteristics will be summarized by cohort for all schools included in the analytic sample. These variables will be summarized with either frequency and percentage (for categorical variables), or with means and SDs (for continuous variables).

Student-level. Baseline student characteristics will be summarized for each cohort/treatment condition at each outcome assessment timepoint (1-year impact for SY 2016-17, 1-year impact for SY 2017-18, 2-year impact for SY 2017-18). These variables are summarized with frequency and percentage. Student race/ethnicity was not mutually exclusive, and students may have classified as more than one race/ethnicity. Therefore, percentages by student race/ethnicity may sum to more than 100%. Student numbers in each intervention and control group reflected all students who were included in at least one academic test outcome analysis for that timepoint.

47   Baseline student characteristics will also be summarized for each cohort for all students
48 included in any analysis. These variables will be summarized with either frequency and
49 percentage (for categorical variables), or with means and SDs (for continuous variables). Student
50 race/ethnicity was not mutually exclusive, and students may have classified as more than one
51 race/ethnicity.
52   Baseline academic test outcomes were assessed for each condition at each timepoint
53 and each outcome. Baseline achievement for the PARCC analyses included students'
54 PARCC scores in the same subject in spring 2016, or i-Ready beginning-of-the-year scores in
55 fall 2016 when students were missing prior PARCC scores. Baseline achievement for the i-
56 Ready analyses included students' i-Ready beginning-of-the-year scores in fall 2016 in the
57 same subject. ESs are calculated as Hedges' g. Similar to Cohen's d, Hedge's g applies a
58 correction to eliminate the potential bias due to the sample size and thus provided
59 comparable outcomes to other reports assessing effect sizes.
60
61 **Attrition**
62   **School-level.** School attrition rate will be used to assess the loss of entire school from the
63 analytic sample due to closure or not having results for a specific test. It is defined as the number
64 of schools in a cohort at the time of outcome over number of schools assigned to the cohort at
65 baseline. This is calculated for each cohort/treatment condition at each timepoint (1-year impact
66 for SY 2016-17, 1-year impact for SY 2017-18, 2-year impact for SY 2017-18) and outcome
67 (reading/mathematics, i-Ready/PARCC).
68   **Student-level.** The cohort-specific student retention rates are calculated as the number of
69 students included in a specific testing outcome analysis in a cohort divided by the number of
70 students included in any outcome analysis in the same cohort.
71
72 **Program Impacts**
73   **Overall impacts**. Overall impacts will be assessed for each cohort/treatment condition at
74 each timepoint (1-year impact for SY 2016-17, 1-year impact for SY 2017-18, 2-year impact for
75 SY 2017-18). Hierarchical linear modeling will be used to assess the impact of the V4B
76 intervention on academic performance. Students were nested within the schools in which they
77 received the intervention. The models analyze program effects on each academic test outcome
78 separately, while controlling for student grade level (3rd through 7th), prior achievement (testing
79 scores), and blocking variables used in randomization (charter school status, school type, pilot
80 study participation, school proportion of low-income and Black students, and whether the school
81 served more than 25% Latinx students). Baseline achievement for the PARCC analyses included
82 students' PARCC scores in the same subject in spring 2016 (SY 2015), or i-Ready beginning-of-
83 the-year scores in fall 2016 (SY 2016) when students were missing prior PARCC scores.
84 Baseline achievement for the i-Ready analyses included students' i-Ready beginning-of-the-year
85 scores in fall 2016 (SY 2016) in the same subject. Tests were two-sided, using a significance
86 level of $P < .05$. Different analyses may have different numbers of students and school samples
87 due to the availability of baseline and post-intervention tests.
88   Effect sizes were calculated as Hedges' g. Similar to Cohen's d, Hedge's g applies a
89 correction to eliminate the potential bias due to the sample size and thus provided comparable
90 outcomes to other reports assessing effect sizes. Effect size estimates and their 95% confidence
91 intervals will be presented as model adjusted estimates.
92

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Differential effects.   Differential effects were assessed for each cohort/treatment condition at each timepoint (1-year impact for SY 2016-17, 1-year impact for SY 2017-18, 2-year impact for SY 2017-18), for the following subgroups: by sex (male or female), by grade level (elementary or middle grades), special education status (participating or not), and baseline achievement (students scoring in the lowest 25% at baseline or those scoring in the 26-100% at baseline). Hierarchical linear modeling was used to examine intervention effects for various student subgroups (sex, grade level, special education status, and baseline achievement) by including interaction terms in the model. The models adjusted for student grade level (3rd through 7th), prior achievement (testing scores), and blocking variables used in randomization (charter school status, school type, pilot study participation, school proportion of low-income and Black students, and whether the school served more than 25% Latinx students). Statistical significance was calculated by conducting a test to see if intervention + intervention × interaction=0 after running the relevant model.

Given the large number of comparisons tested in the analyses of differential treatment effects, multiple comparison corrections were applied using the Bonferroni procedure. Tests were two-sided, using a significance level of $p < .05$.

Effect size estimates and their 95% confidence intervals will be presented as model adjusted estimates.