

Cluster-Randomized Controlled Trial of School-Based Visual Screening for Kindergarten Children

Purpose: Some 10% of kindergarten children have undetected refractive errors and 3-5% need treatment to prevent amblyopia. In many jurisdictions, no universal screening program exists to detect these problems. We hypothesized that offering visual screening to children in senior kindergarten (i.e., age 5) would lower the later prevalence of amblyopia and other visual problems.

Methods: 50 high-needs schools in Toronto, Canada were randomly assigned to screening or no screening (i.e., status quo). Children in senior kindergarten ($n = 1468$) at 25 schools were screened using 3 tests (visual acuity, stereoacuity, photoscreener). 747 children (50.9%) passed screening, 551 children (37.5%) failed screening, 163 children (11.1%) were absent for screening, and 7 children (0.05%) opted out. Children who failed screening or were absent were offered a comprehensive eye exam (with cycloplegia) at school with an optometrist and it was attended by 408 (74%) and 49 (30%), respectively. If glasses were needed, they were dispensed at no cost ($n = 225$). When the children were in Grade 2 (~1.5 years after screening), visual acuity, stereoacuity, and uncorrected refractive errors (with photoscreener) were assessed in all 50 schools ($n = 2715$ children).

Results: The prevalence of amblyopia in Grade 2 did not differ between screened schools (8.6%) and non-screened schools (7.5%), $p = .10$. There was also no difference in the prevalence of visual problems other than amblyopia (45.1% versus 47.1%, $p = .51$). However, in screened schools more children were wearing glasses (5.0% versus 3.5%, $p = .05$), and more children reported that they had lost or broken their glasses (8.3% versus 4.7%, $p = .01$).

Conclusions: Visual screening is effective in identifying children with previously undiagnosed visual problems. However, the benefits may not translate to better visual outcomes 1.5 years later because of other factors (e.g., delays in seeing an optometrist, no support for buying or replacing glasses, parents' (and teachers') lack of understanding about the importance of treatment, lack of treatment compliance). In addition to visual screening, strategies to mitigate these factors are necessary to improve children's visual health.

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