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# SCHOOL-BASED OPTOMETRIC AND REFRACTIVE-CARE INTERVENTIONS IN CHILDREN AND ADOLESCENTS: A SCOPING REVIEW OF QUALITY-OF-LIFE, FUNCTIONAL, EDUCATIONAL, AND IMPLEMENTATION OUTCOMES

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## ABSTRACT

*Uncorrected refractive error remains one of the leading causes of visual impairment in children and adolescents worldwide and has consequences that extend beyond visual acuity, affecting school participation, functional performance, and psychosocial well-being. This scoping review mapped and critically synthesized the available literature on school-based optometric and refractive-care interventions, with particular attention to vision-related quality of life (VRQoL), functional and educational outcomes, adherence to spectacle wear, and implementation-related barriers and facilitators. The evidence base included review articles, randomized and non-randomized intervention studies, observational designs, qualitative studies, mixed-methods studies, and psychometric investigations of pediatric patient-reported outcome measures (PROMs). Across the literature, interventions clustered into screening-only models, screening plus refraction, screening plus spectacle provision, educational and adherence-support strategies, and integrated school eye health models. The evidence suggests that multicomponent models are more likely than screening alone to generate meaningful benefits in functional vision, selected educational outcomes, and, in some studies, VRQoL. However, the field remains methodologically heterogeneous, particularly in outcome selection and measurement. PROM use is increasing, but refractive-specific pediatric tools remain*

***underused in school-based research. Implementation barriers were consistently reported at policy, school, family, and service-delivery levels, especially in underserved settings. Overall, the literature supports the value of school-based refractive-care interventions as child health and educational equity strategies, while highlighting the need for stronger implementation models, longer follow-up, and more standardized child-centered outcome assessment.***

**KEYWORDS:** School Eye Health, Refractive Error, Children, Vision-Related Quality Of Life, Spectacle Adherence, Implementation, Scoping Review.

## INTRODUCTION

Uncorrected refractive error remains one of the leading causes of visual impairment in children and adolescents worldwide and continues to represent a substantial, yet highly treatable, public health challenge. In school-age populations, inadequate access to timely eye care and corrective lenses may compromise not only visual function, but also educational participation, classroom performance, autonomy, and psychosocial well-being (Harvey et al., 2024; Pirindhavellie et al., 2023; Wong et al., 2023). Because children spend much of their time in educational settings, schools have increasingly been recognized as strategic platforms for the early identification and management of visual problems, particularly in underserved and low-resource contexts (Burnett et al., 2018; Little et al., 2025; Sharma et al., 2012).

Over the past decade, school-based eye health initiatives have expanded in scope and visibility, moving beyond simple vision screening toward broader models that may include refraction, spectacle provision, health education, referral systems, and adherence support. This evolution reflects growing recognition that detection alone is insufficient if children do not receive affordable correction, fail to attend follow-up care, or experience social and practical barriers to spectacle wear (Anokye et al., 2025; Harvey et al., 2024; Morjaria et al., 2019). As a result, school-based optometric and refractive-care interventions are now being discussed not only as clinical or preventive actions, but also as equity-oriented public health strategies with educational and developmental consequences (Fernandes & Köptcke, 2021; Yashadhana et al., 2021).

The existing evidence suggests that refractive correction in children may improve outcomes that extend beyond visual acuity. Recent studies and reviews have reported gains in reading-related tasks, school participation, educational functioning, and selected dimensions of well-being following spectacle provision or broader school-based eye care interventions (Neitzel et al., 2021; Nguyen et al., 2025; Nishimura et al., 2024; Pirindhavellie et al., 2023). At the same time, the evidence base remains heterogeneous. Studies differ markedly in intervention models, target populations, follow-up periods, implementation contexts, and the outcomes selected for evaluation (Little et al., 2025; Opare et al., 2020).

This inconsistency is especially evident in pediatric refractive-care research, where outcome measurement remains methodologically diverse. Although there has been growing interest in using patient-reported outcome measures to capture the everyday impact of visual problems in children, relatively few tools have been specifically developed or validated for pediatric refractive error. Existing studies use a combination of generic health-related quality-of-life measures, vision-specific questionnaires, and broader eye-related instruments, making comparison across studies difficult (Magakwe et al., 2024; Wu et al., 2024). More recent instruments such as the Pediatric Eye Questionnaire (PedEyeQ), the Pediatric Refractive Error Profile 2 (PREP2), and the Student Refractive Error and Eyeglasses Questionnaire–Revised (SREEQ-R) have improved the measurement landscape, yet their uptake remains uneven and their use in school-based research is still limited (Cerullo et al., 2024; Han et al., 2022; Leske et al., 2021; Marupuru et al., 2021).

Beyond questions of effectiveness and measurement, there is increasing recognition that implementation factors strongly shape the success of school-based eye health programs. Evidence from qualitative and mixed-methods studies suggests that barriers may occur at multiple levels, including weak coordination between health and education sectors, lack of sustained financing, limited school-level capacity, poor referral completion, family-level economic constraints, and stigma related to spectacle wear (Chan et al., 2023; Seelam et al., 2021; Yashadhana et al., 2021, 2023). These issues are particularly relevant in low- and middle-income countries, where school-based services may offer one of the few feasible entry points for refractive-care delivery, but where continuity of care is often fragile (Harvey et al., 2024; Little et al., 2025).

In Latin America, these concerns are especially important. Although regional experience suggests that school-based health platforms could support more equitable access to child eye care, the available evidence remains fragmented. Colombia and Brazil, for example, illustrate both the potential and the limitations of current models: school-based initiatives exist, but coverage is incomplete, coordination is inconsistent, and sustained policy support is often lacking (Fernandes & Köptcke, 2021; Yashadhana et al., 2021).

Given this context, a scoping review is warranted. Unlike a narrowly focused systematic review, a scoping review is particularly well suited to map the breadth, range, and characteristics of a heterogeneous evidence base and to identify conceptual, methodological, and implementation gaps (Tricco et al., 2018). Therefore, the aim of this

scoping review is to map and critically synthesize the available evidence on school-based optometric and refractive-care interventions in children and adolescents, with particular attention to quality-of-life, functional, educational, and implementation outcomes.

## METHODS

### Review Design

This study was designed as a scoping review to map and critically synthesize the available literature on school-based optometric and refractive-care interventions in children and adolescents. A scoping approach was considered appropriate because the field includes heterogeneous intervention models, outcome domains, study designs, and measurement strategies, making a narrowly focused synthesis potentially premature. The review was structured to support reporting in accordance with the PRISMA Extension for Scoping Reviews (PRISMA-ScR; Tricco et al., 2018).

### Review Question

The review was guided by the following question: How do school-based optometric and refractive-care interventions affect vision-related quality of life, functional performance, educational participation, and implementation-related outcomes among children and adolescents, particularly in underserved settings?

### Objectives

The primary objective of the review was to map and critically synthesize the available evidence on the effects of school-based optometric and refractive-care interventions on vision-related quality of life, functional outcomes, educational participation, and implementation-related factors in children and adolescents. Specific objectives were to identify the main intervention models, describe the outcomes most frequently assessed, map the patient-reported and vision-specific instruments used in pediatric refractive-care research, examine implementation-related factors such as access, spectacle compliance and follow-up, and identify knowledge gaps and methodological limitations in the literature.

### Eligibility Criteria

The review included studies focused on children and adolescents in school-age populations, including students in primary, middle, or secondary education. Eligible studies addressed school-based optometric or refractive-care interventions, including school vision screening linked to refraction or optical correction, spectacle provision in school settings, multicomponent school eye health interventions, and strategies to improve spectacle adherence or follow-up care. The review focused on school-based settings, educational institutions, school health programs, and community–school linked eye health initiatives. Primary outcome domains of interest were VRQoL, functional vision, functional performance in daily or school-related tasks, and educational participation or performance. Secondary outcomes included emotional well-being, dependence or autonomy, spectacle adherence or compliance, access and implementation barriers, referral completion, and sustainability-related outcomes. Systematic reviews, scoping reviews, randomized and non-randomized intervention studies, quasi-experimental studies, observational studies, mixed-methods studies, and qualitative studies were eligible. Editorials, commentaries, conference abstracts with insufficient data, and protocols were excluded from the main synthesis. The primary search window covered studies published between 2020 and 2026; earlier studies were retained when they were foundational to school eye health, spectacle adherence, or instrument development. Studies published in English, Spanish, and selected Portuguese sources were considered.

### Information Sources and Search Strategy

Evidence identification was based primarily on structured searches conducted through Consensus and on manual review of high-priority references identified during preliminary evidence mapping. The search strategy was organized in thematic blocks focused on (a) the public health relevance of uncorrected refractive error in children, (b) school-based optometric and refractive-care interventions, (c) vision-related quality of life and pediatric PROMs, (d) educational and functional outcomes, (e) spectacle adherence and follow-up, and (f) implementation barriers and facilitators. Additional targeted searching was undertaken to strengthen three areas that were comparatively underrepresented in the preliminary corpus: Latin American and Colombian evidence, qualitative implementation barriers and facilitators, and recent pediatric PROMs relevant to refractive error.

### Study Selection and Data Extraction

Titles and summaries generated through the search process were screened for apparent relevance to the review question. Potentially eligible studies were then examined in greater detail to assess alignment

with predefined population, concept, context, and outcome criteria. Included studies were categorized as core, secondary, or contextual according to their contribution to the main analytic domains. A structured extraction matrix was developed and applied to the included studies. Extraction fields included author and year, country or region, study design, population and age range, school or school-linked context, type of intervention or program, follow-up duration, outcomes assessed, PROMs or vision-specific instruments used, main findings, implementation-related findings, and relevance for synthesis.

**Data Synthesis**

The findings were synthesized using a descriptive and critical narrative approach. Rather than summarizing the literature study by study, evidence was organized into five analytic domains: characteristics of included studies, types of school-based interventions, outcome domains assessed across studies, patient-reported outcome measures and other measurement approaches, and implementation barriers, facilitators, and sustainability issues. Tables were used to summarize the main characteristics of included studies, intervention typologies, outcome domains, measurement tools, and implementation findings.

## RESULTS

**Characteristics of Included Studies**

The evidence base was methodologically heterogeneous and geographically broad. It included systematic reviews, scoping reviews, randomized and cluster-randomized trials, observational studies, validation studies, mixed-methods studies, and qualitative investigations. Most studies were conducted in low- and middle-income countries or in contexts with clear relevance to underserved child populations, although some instrument-development and psychometric studies originated in high-income settings. Review-level evidence played a major role in framing public health relevance, intervention typologies, compliance, and measurement challenges. Primary studies were particularly useful for documenting educational outcomes, adherence to spectacle wear, implementation barriers, and psychometric performance of pediatric quality-of-life instruments. Latin American evidence was comparatively limited but included important contributions from Colombia and Brazil that highlighted both the promise and fragility of school-based eye health efforts in the region (Fernandes & Köptcke, 2021; Yashadhana et al., 2021).

**Types of School-Based Optometric and Refractive-Care Interventions**

Across the included literature, school-based interventions clustered into several broad models rather than a single standardized approach. The simplest model involved screening-only strategies aimed at identifying visual deficits and referring children for further assessment (Little et al., 2025; Opare et al., 2020). A second model combined screening with refraction and referral, while a third extended this further to include spectacle provision, either free of charge or at subsidized cost (Burnett et al., 2018; Pirindhavellie et al., 2023). More comprehensive models integrated visual health education, parent or teacher engagement, and structured follow-up to improve adherence and referral completion (Morjaria et al., 2020; Wu et al., 2023). A smaller but important subset of studies described integrated school eye health models in which vision care was embedded within broader school health systems and linked to policy, training, and community-level coordination (Chan et al., 2023; Harvey et al., 2024; Seelam et al., 2021).

**Outcome Domains Assessed Across Studies**

The included studies assessed a wide range of outcomes, although these were not distributed evenly across the evidence base. The most commonly reported domains were screening yield or service outcomes, spectacle adherence or compliance, and educational or functional outcomes. A substantial portion of the literature also examined implementation-related outcomes, such as access, referral completion, acceptability, and integration into school health systems. By contrast, vision-related quality of life and other patient-reported outcomes were less consistently assessed. While recent studies have begun to incorporate eye-related quality-of-life and functional vision measures in pediatric populations, these outcomes remain less common than academic performance, spectacle wear, or service-delivery indicators (Magakwe et al., 2024; Wu et al., 2024).

**Patient-Reported Outcome Measures and Other Measurement Approaches**

One of the clearest findings of the review was the heterogeneity of outcome measurement in pediatric refractive-care research. Three tools emerged as particularly relevant. First, PedEyeQ was consistently identified as a strong eye-related

quality-of-life instrument capable of capturing child, proxy, and parent perspectives across a range of pediatric eye conditions, including refractive error (Leske et al., 2020, 2021; Ntodie et al., 2025). Second, PREP2 offered a more refractive-specific measurement framework, with evidence of cross-cultural adaptation and acceptable psychometric performance (Cerullo et al., 2024; Han et al., 2022). Third, SREEQ-R provided a focused option for evaluating refractive-error-related quality of life in children wearing spectacles, particularly in myopic populations (Marupuru et al., 2021). Despite these advances, the literature highlighted a shortage of validated tools for younger children, a limited number of refractive-error-specific PROMs, and insufficient adaptation of available instruments for many low- and middle-income settings (Magakwe et al., 2024; Wu et al., 2024).

**Implementation Barriers, Facilitators, and Sustainability Issues**

Implementation-related findings were among the most consistent themes across qualitative, mixed-methods, and health-systems-oriented studies. At the policy and systems level, common obstacles included the absence of national school eye health plans, weak coordination between health and education sectors, limited financing, and dependence on external donors (Harvey et al., 2024; Yashadhana et al., 2021, 2023). At the school level, teacher workload, competing academic priorities, and limited institutional ownership were frequently described (Chan et al., 2023; Seelam et al., 2021). At the family and community level, economic barriers, transport costs, poor referral understanding, stigma associated with spectacle wear, and distrust of services were recurrent concerns (Lohfeld et al., 2021; Morjaria et al., 2019; Oo et al., 2021). Facilitators included sustained intersectoral coordination, teacher training with clear protocols, school-based or near-school service provision, affordable or free spectacles, parent education, anti-stigma activities, and structured systems for follow-up and data monitoring (Khatri et al., 2024; Morjaria et al., 2020; Nishimura et al., 2024).

**Evidence Gaps Identified Across the Literature**

Several evidence gaps were apparent. First, relatively few studies simultaneously examined functional, educational, and quality-of-life outcomes within the same intervention framework. Second, although school-based refractive-care interventions are often justified on equity grounds, Latin American evidence remained limited. Third, pediatric refractive-care research still lacks a sufficiently standardized outcome framework, especially with regard to PROMs. Finally, many studies focused on detection or short-term service outputs rather than on longer-term continuity, adherence, and sustainability.

**Table 1.** Characteristics of included studies.

| Study | Country/region | Design | Population/age | School setting | Main focus |
|---|---|---|---|---|---|
| Burnett et al., 2018 | LMICs, multi-country | Systematic review | School-age children | School-based | School eye-care service interventions |
| Opare et al., 2020 | LMICs | Systematic review | Children | School-based | Vision screening and refractive error reduction |
| Harvey et al., 2024 | LMICs | Scoping review | Children and adolescents | School eye health | Program priorities and implementation |
| Little et al., 2025 | Global | Review | Children and adolescents | School-based | Screening models, rationale, impact, and challenges |
| Pirindhavellie et al., 2023 | Multi-country | Systematic review | Children with URE | Mostly school-age contexts | Spectacle correction and well-being |
| Yashadhana et al., 2021 | Colombia | Qualitative case study | Stakeholders | School-based | Access barriers in Bogotá |
| Fernandes & Köptcke, 2021 | Brazil | Cross-sectional study | Program-level school data | School health program | Eye health action coverage |
| Neitzel et al., 2021 | China | Cluster RCT | Students, Grades 3–7 | School-based | Vision intervention and academic performance |
| Nishimura et al., 2024 | School-based trial context | Cluster-randomized follow-up | Children | School-based | Continued care and provision of glasses |
| Morjaria et al., 2020 | India | Randomized trial | Children receiving spectacles | School-based | mHealth + education for spectacle wear |
| Leske et al., 2020 | United States | Observational study | Children wearing glasses | Not specifically school-delivered | Eye-related QoL and functional vision |
| Ntodie et al., 2025 | Africa | Cohort / observational | Children with URE | Mixed | Eye-related QoL and functional vision |

**Table 2.** Types of school-based optometric and refractive-care interventions identified in the literature.

| Intervention model | Main components | Representative studies | Main notes |
|---|---|---|---|
| Screening only | Vision screening and referral recommendation | Opare et al., 2020; Little et al., 2025 | Useful for detection, but limited if not linked to treatment |
| Screening + refraction | Screening followed by refractive assessment | Burnett et al., 2018; Harvey et al., 2024 | Stronger than screening alone, but treatment access still variable |
| Screening + spectacle provision | Detection plus free or subsidized glasses | Pirindhavellie et al., 2023; Anokye et al., 2025; Nishimura et al., 2024 | More likely to improve functional and educational outcomes |
| Screening + education | School/family education on visual health and spectacle use | Morjaria et al., 2020; Wu et al., 2023 | Improves knowledge and may increase adherence |
| Integrated school eye health | Eye health embedded in school health systems | Chan et al., 2023; Seelam et al., 2021; Harvey et al., 2024 | Most robust model for sustainability and scale-up |
| Follow-up / adherence interventions | Referral tracking, reminders, adherence support | Morjaria et al., 2020; Khatri et al., 2024; Wu et al., 2023 | Critical because detection alone does not ensure sustained benefit |

**Table 3.** Outcome domains assessed across included studies.

| Study | VRQoL | Functional vision | Educational outcomes | Adherence / compliance | Implementation / access |
|---|---|---|---|---|---|
| Pirindhavellie et al., 2023 | Yes | Yes | Yes | Partial | No |
| Wu et al., 2024 | Yes | Yes | No | No | No |
| Neitzel et al., 2021 | No | Indirect | Yes | No | No |
| Nishimura et al., 2024 | No | Yes | Yes | Partial | Yes |
| Nguyen et al., 2025 | No | Indirect | Yes | Yes | No |
| Morjaria et al., 2019 | No | No | No | Yes | Partial |
| Morjaria et al., 2020 | No | No | No | Yes | Partial |
| Wu et al., 2023 | No | No | No | Yes | Partial |
| Yashadhana et al., 2021 | No | No | No | Partial | Yes |
| Chan et al., 2023 | No | No | No | Partial | Yes |
| Leske et al., 2020 | Yes | Yes | No | No | No |
| Ntodie et al., 2025 | Yes | Yes | No | No | No |

**Table 4.** Patient-reported outcome measures and vision-specific instruments used across studies.

| Instrument | Target population | Main domains measured | Refractive-error specific? | Representative studies | Notes |
|---|---|---|---|---|---|
| PedEyeQ | Children with eye conditions, including refractive error | Functional vision, eye-related QoL, parent concern | Partially | Leske et al., 2020, 2021; Ntodie et al., 2025 | Strong pediatric instrument with child, proxy, and parent versions |
| PREP2 | Children/adolescents with refractive error | Refractive-specific QoL and functional domains | Yes | Cerullo et al., 2024; Han et al., 2022 | Increasing cross-cultural use |
| SREEQ-R | Myopic children / spectacle users | Refractive error and eyeglasses-related QoL | Yes | Marupuru et al., 2021 | Useful for spectacle-related QoL, especially in myopia |
| Generic HRQoL tools | Children and adolescents | General health-related quality of life | No | Mapped in Wu et al., 2024 | Broader, but less sensitive to eye-specific issues |
| Mixed vision-specific tools | Various pediatric eye populations | Eye-related QoL, visual function, psychosocial domains | Variable | Wu et al., 2024; Magakwe et al., 2024 | The literature remains heterogeneous |

**Table 5.** Implementation barriers and facilitators in school-based eye health and refractive-care programs.

| Level | Main barriers | Main facilitators | Representative studies | Implications |
|---|---|---|---|---|
| Policy / system | Weak health-education coordination, unstable financing, absent national plans | Interministerial coordination, long-term financing, policy integration | Harvey et al., 2024; Yashadhana et al., 2021, 2023 | System design strongly shapes feasibility and scale |
| School / institutional | Teacher workload, low prioritization, limited staff capacity | Teacher training, clear protocols, school leadership support | Chan et al., 2023; Seelam et al., 2021 | Schools need support to move beyond opportunistic screening |

| | | | | |
|---|---|---|---|---|
| Family / community | Cost, transport, poor referral understanding, stigma, distrust of services | Parent education, anti-stigma efforts, clear referral communication | Lohfeld et al., 2021; Yashadhana et al., 2021; Oo et al., 2021 | Family-level barriers often explain poor follow-up |
| Student / individual | Low perceived need, discomfort, teasing, low motivation to wear glasses | Attractive frames, better fit, peer normalization, child-friendly education | Morjaria et al., 2019; Dhirar et al., 2020; Du et al., 2022 | Acceptability is central to adherence |
| Service delivery / follow-up | Weak referral completion, poor continuity, limited replacement systems | Follow-up tracking, reminders, integrated referral pathways | Morjaria et al., 2020; Khatri et al., 2024; Nishimura et al., 2024 | Detection without continuity reduces real-world impact |
| Sustainability | Donor dependence, fragmented implementation, lack of long-term ownership | Embedded school health models, data systems, local workforce, stable funding | Seelam et al., 2021; Chan et al., 2023 | Sustainability depends on institutionalization, not isolated campaigns |

## DISCUSSION

This scoping review mapped a heterogeneous but increasingly relevant body of evidence on school-based optometric and refractive-care interventions in children and adolescents. Overall, the review shows that school-based eye health is no longer limited to isolated vision screening initiatives. Instead, the literature reflects a broader transition toward multicomponent models that may include refraction, spectacle provision, education, referral pathways, and adherence support (Anokye et al., 2025; Burnett et al., 2018; Harvey et al., 2024). This shift is important because the available evidence consistently suggests that detection alone is insufficient when not accompanied by access to correction, follow-up, and social support for spectacle use (Little et al., 2025; Morjaria et al., 2019).

One of the main findings of this review is that the literature supports the educational and functional relevance of school-based refractive-care interventions. Studies focusing on academic and task-related outcomes indicate that visual correction may improve reading-related performance, classroom engagement, and selected indicators of academic achievement (Neitzel et al., 2021; Nguyen et al., 2025; Nishimura et al., 2024). These findings reinforce the idea that refractive care in childhood should not be viewed only as a clinical or ophthalmic matter, but also as an educational and developmental issue.

A second major finding concerns the methodological diversity of pediatric outcome measurement. The review identified substantial heterogeneity in the instruments used to assess health-related and vision-related quality of life in children with refractive error. PedEyeQ, PREP2, and SREEQ-R emerged as the most relevant tools in this field, yet their use remains uneven across studies and settings (Cerullo et al., 2024; Leske et al., 2021; Magakwe et al., 2024; Marupuru et al., 2021; Wu et al., 2024). In particular, relatively few school-based intervention studies appear to have incorporated refractive-specific pediatric PROMs as primary or co-primary outcomes. This represents an important methodological gap.

The review also highlights that implementation issues are not peripheral; they are central determinants of real-world success. Across qualitative, mixed-methods, and implementation-oriented studies, barriers were repeatedly described at multiple levels. System-level problems included fragmented governance, weak coordination between health and education sectors, and insufficient or unstable financing (Harvey et al., 2024; Yashadhana et al., 2021, 2023). At the school level, teacher workload, competing academic priorities, and limited institutional ownership constrained implementation (Chan et al., 2023; Seelam et al., 2021). At the family and community level, cost, transport, stigma, low awareness, and distrust of services frequently affected referral completion and spectacle adherence (Lohfeld et al., 2021; Morjaria et al., 2019; Oo et al., 2021).This review further suggests that adherence and continuity of care remain among the weakest links in school-based refractive-care programs. Several studies showed that children may be successfully identified and prescribed spectacles, yet still fail to wear them consistently or to complete follow-up care. The literature supports a transition from one-time campaign models toward longitudinal, school-linked care pathways that include parent education, affordable or free spectacles, replacement systems, school-based reinforcement, and clear referral communication (Dhirar et al., 2020; Khatri et al., 2024; Morjaria et al., 2020; Wu et al., 2023).

An additional contribution of the review is the attention given to underserved settings and Latin America. While the global evidence base is growing, the regional literature remains comparatively limited. The available evidence from Colombia and Brazil indicates that school-based eye health is feasible and potentially impactful, but often lacks routine institutionalization, stable financing, and multisectoral coordination (Fernandes & Köptcke, 2021; Yashadhana et al., 2021). More regional

studies are needed, especially those that combine programmatic, educational, and child-reported outcomes.

The review has several strengths. It brings together evidence from intervention studies, implementation research, adherence-focused studies, and pediatric PROM literature within a single analytic framework. It also extends beyond clinical effectiveness to include child-centered, educational, and systems-level perspectives. However, some limitations should be acknowledged. The evidence base itself is heterogeneous, which limits direct comparison across studies. Intervention content, outcomes, follow-up periods, and measurement tools varied substantially. In addition, as in many scoping reviews, the purpose of this synthesis was breadth and mapping rather than formal risk-of-bias appraisal or pooled quantitative effect estimation (Tricco et al., 2018).

Taken together, the literature suggests that school-based optometric and refractive-care interventions hold substantial promise, but their impact depends on more than simply identifying visual deficits. The strongest evidence points toward multicomponent models that link screening with correction, education, follow-up, and implementation support. Future research should prioritize longitudinal and comparative designs, wider use of pediatric refractive-specific PROMs, and stronger reporting of implementation processes, particularly in low-resource and Latin American settings.

**CONCLUSION**

This scoping review shows that school-based optometric and refractive-care interventions in children and adolescents are associated with a broad range of potentially meaningful outcomes, including improvements in visual access, selected functional and educational indicators, and, in some studies, vision-related quality of life. The literature also indicates that these benefits are most plausible when school-based programs extend beyond screening alone and incorporate optical correction, education, referral support, and adherence-oriented follow-up. At the same time, the field remains methodologically and programmatically fragmented. Outcome measurement is highly heterogeneous, child-specific PROMs are still underused, and implementation barriers continue to limit the reach and sustainability of otherwise promising interventions. Overall, the evidence supports the value of school-based refractive-care strategies as part of broader child health and educational equity efforts.

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