



# Uncorrected refractive error and amblyopia in school children in Jerusalem

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**Purpose:** To investigate the prevalence of uncorrected refractive error in schoolchildren in Jerusalem.

## Methods:

Healthy boys ages 6-12 from previous research studies<sup>1,2,3</sup>

Parental screening questionnaire to exclude children with amblyopia, strabismus and hyperopia.

A full eye exam was then performed.

Habitual visual acuity (HBA) was measured including with glasses if the children presented with them

Cycloplegic autorefractometry was measured (VX130 Lunau)

## Definitions:

- Visual Impairment (VI) = HBA  $\leq$  20/40.
- Amblyopia = best corrected VA  $\leq$  20/40 in at least one eye
- Astigmatism as  $\leq$ -0.75 D
- Myopia as spherical equivalent (SE)  $\leq$ -0.50 D and hyperopia as  $\geq$ +0.50 D

Descriptive statistics were used to calculate the prevalence of amblyopia and each refractive error.

## Results:

205 boys (average age 8.8  $\pm$  1.7)

2% of the entire cohort presented with amblyopia.

The prevalence of visual impairment was 28% (N=57), with 21.4% (N=44) and 6.3% (N=13) for both eyes and one eye, respectively.

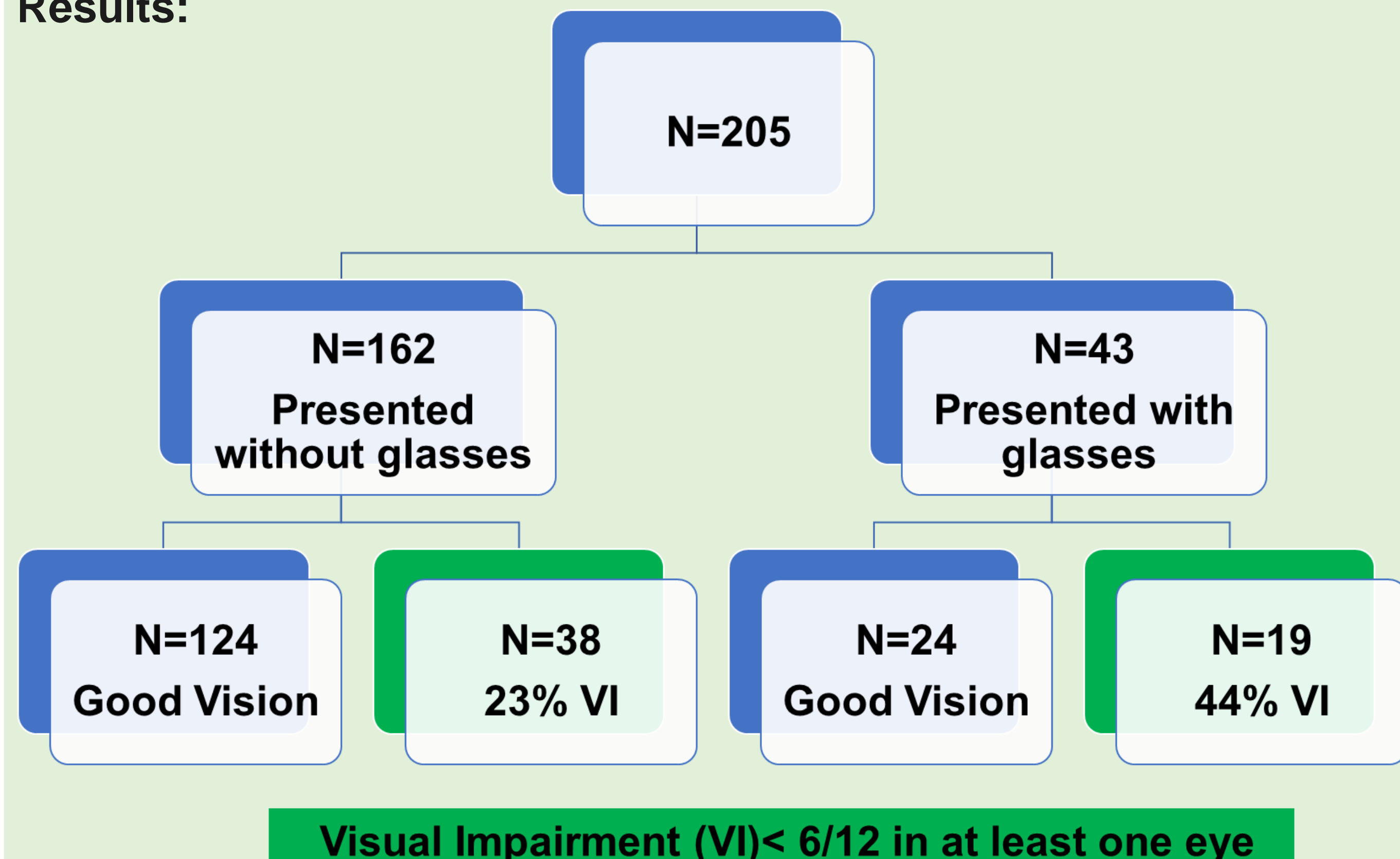
4.4% of children presented with hyperopia and VI.

Refractive error was the cause of the VI in 93% (N=53) of the children, while the rest (7%, N=4) were diagnosed with amblyopia.

Visual impairment was caused by myopia or hyperopia in 83% (N=44) and 17% (N=9), respectively. In addition, 38% (N=20) of the children with visual impairment had astigmatism

	Monocular N	binocular N	Subjects N (%)
<b>Myopia (SE) <math>\leq</math>-0.50</b>	20	55	75 (36.6%)
<b>Total Hyperopia</b>	30	74	104 (50.8%)
<b>Significant Hyperopia (SE<math>\geq</math>2.5)</b>	6	4	10 (4.9%)
<b>Hyperopia (SE<math>\geq</math>0.5)</b>	24	70	94 (45.9%)
<b>Significant astigmatism (cyl<math>\leq</math>-3.00)</b>	2	4	3 (2.0%)
<b>Astigmatism (cyl<math>\leq</math>-0.75)</b>	28	33	61 (29.8%)
<b>Habitual VA <math>&lt;</math>6/9</b>	20	56	76 (37.1%)
<b>Subjects with Habitual VA <math>\leq</math>6/12</b>	13	44	57 (27.8%)
<b>Amblyopia <math>\leq</math>6/12 BCVA</b>	1	3	4 (2.0%)
<b>Myopia</b>	6	38	44 (21.5%)
<b>Total Hyperopia</b>	4	5	9 (4.4%)
<b>Significant Hyperopia (SE<math>\geq</math>2.5)</b>	2	0	2 (1.0%)
<b>Hyperopia (SE<math>\geq</math>0.5)</b>	2	5	7 (3.4%)
<b>Children who needed glasses but didn't know it</b>			38

## Results:



	OD (Range)	OS (Range)
<b>Uncorrected VA</b>	0.67 $\pm$ 0.36**	0.69 $\pm$ 0.36**
	0.01-1.20	0.01-1.20
<b>Habitual corrected VA</b>	0.74 $\pm$ 0.31	0.75 $\pm$ 0.31
	0.01-1.20	0.01-1.20
<b>Subjective refraction</b>	-0.53 $\pm$ 1.66**	-0.56 $\pm$ 1.60**
<b>BCVA</b>	0.94 $\pm$ 0.14**	0.94 $\pm$ 0.13**
<b>Cycloplegic refraction (SE)</b>	-0.08 $\pm$ 1.82**	-0.11 $\pm$ 1.75**
<b>Axial length</b>	23.34 $\pm$ 1.14**	23.31 $\pm$ 1.05**

## Discussion:

- A high prevalence of uncorrected refractive error was observed.
- Many children had amblyopia and hyperopia despite a priori exclusion of children with these conditions. Parents may be unaware of their children's visual and refractive statuses, even for children who already have glasses.
- Vision screening in first grade is not sufficient to insure good vision in school.

## References:

- 1 Gordon-Shaag A, Shneor E, Doron R et al. Environmental and Behavioral Factors with Refractive Error in Israeli Boys. *Optom Vis Sci* 2021; 98: 959-970.
- 2 Shneor E, Doron R, Levine J et al. Objective Behavioral Measures in Children before, during, and after the COVID-19 Lockdown in Israel. *Int J Environ Res Public Health* 2021; 18.
- 3 Shneor E, Ostrin LA, Doron R et al. Baseline characteristics in the Israel refraction, environment, and devices (iREAD) study. *Sci Rep* 2023; 13: 2855.

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