

Significant Increase in Myopia and Astigmatism in Hong Kong Children after Study at Home during COVID 19 Lockdown

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Background

The Education Bureau had announced a school suspension during the COVID-19 pandemic to contain the spread of infection, and schoolchildren were encouraged to learn at home using online resources. Because refractive-error development is closely associated with personal lifestyle and visual habits,¹⁻³ this study aimed to investigate whether there has been a change in astigmatism and myopia (or short-sightedness) among primary school children after the school suspension period amid the COVID.

Method



Cross-sectional data

- 2018: n = 112
 - 2020: n = 173
- Two separate cohorts

Longitudinal data

- n = 38 participated in both vision screenings

Results

Cross-sectional: Refractive Changes (n = 285)

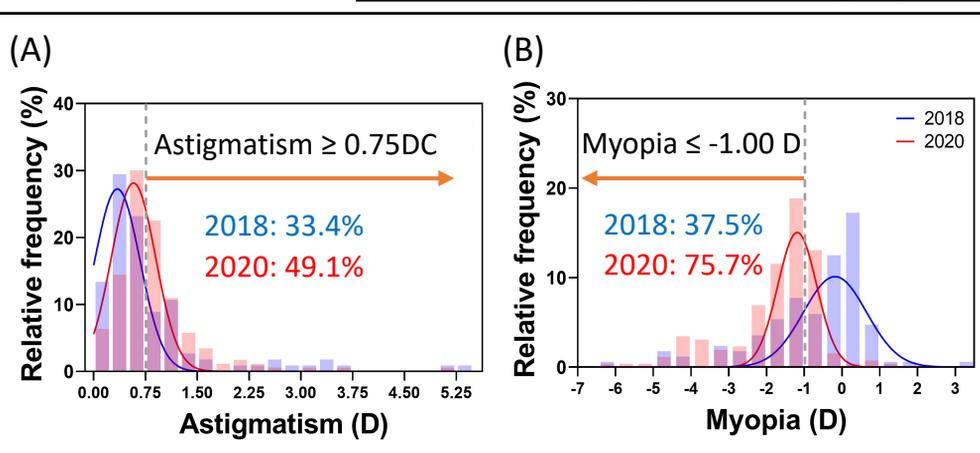


Fig 1. Distribution of (A) astigmatism and (B) myopia in the 2018 and 2020 surveys.

Proportions of astigmatism (Cyl ≥ 0.75 D) and myopia (SE ≤ -1.00 D) were significantly higher in 2020 than in 2018 (Chi-squared tests, $p < 0.05$).

Longitudinal: Refractive Changes (n = 38)

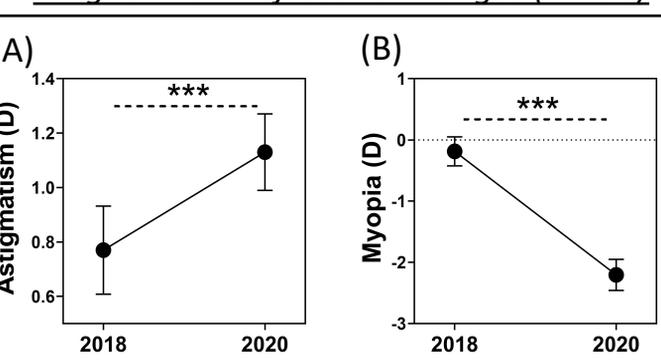


Fig 2. Longitudinal change (Mean \pm SE) in (A) astigmatism & (B) myopia of 38 children who participated in both vision surveys.

Magnitudes of both astigmatism and myopia were significantly increased by 0.35 ± 0.40 D and -1.63 ± 0.61 D, respectively (unpaired t-test, *** $p < 0.001$).

Longitudinal: Questionnaire data (n = 38)

	2018	2020
Non-screen time (hr/day)	0.68 (0, 1.45)	1.11 (0.50, 1.78)
Handheld digital screen time (hr/day)	0.90 (0, 1.73)*	2.29 (1.25, 3.00)*
Outdoor time (hr/day)	0.50 (0, 1.07)*	1.00 (0.57, 1.64)*
Viewing distance (cm)		
Reading/Writing	25.03 \pm 5.93 #	20.66 \pm 7.18 #
Tablet use	24.64 \pm 5.92 #	21.43 \pm 6.22 #

Children spent more time on digital screens and less time outdoor in 2020 than in 2018 (Wilcoxon signed-rank tests, * $p < 0.05$). They also tended to read/write and use tablets closer (paired t-tests, # $p < 0.05$).

Conclusion

A significant increase in myopia and astigmatism was found after the school suspension period. While children in the 2020 cohort tended to spend more time on digital screens and read/write and use tablets at closer viewing distances, further studies are needed to determine if the increased astigmatism is attributable to lifestyle changes over the COVID-19 lockdown period.

References

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