



LEHP-Australia Lions Eye Health Program



References regarding outdoor activities in reducing the incidence of myopia.

https://www.optometry.org.au/patient_care_management/child-myopia-standard-of-care-on-the-way/

The report includes results of a survey of 1,003 parents of children aged 0 to 18.

Chief Clinical Officer of Optometry Australia and a member of the working group, Luke Arundel, said: 'Myopia is rapidly becoming a serious public health concern in Australia, yet this survey shows that 65 per cent of Australian parents, with children 0-17 years old, do not know what myopia is, and only 12 per cent recognise the health risk that their children might develop later in life from child myopia.'

'This is of significant concern given that high myopia is also associated with comorbidities including retinal detachment, glaucoma, cataracts and myopic maculopathy. The risk of developing any of these conditions increases along with any increase in myopia.'

Mr Arundel said one reason for the increase in prevalence of high myopia was that onset of myopia was occurring earlier in life. In 1983, typical onset was about 11 years of age but in 2000, it was just eight.

Key statistics from the report include:

- 76 per cent of parents of children under 12 believe glasses are the best course of action if a primary school child is diagnosed with myopia but there are many treatment options that should be discussed.
- Almost half (49%) of Australian parents of children aged 17 and under don't know what causes myopia.
- Only 12 per cent of parents know of lifestyle factors that impact on child myopia (low levels of outdoor activity, low levels of light exposure, prolonged near tasks such as reading and gaming on portable devices).
- 31 per cent of Australian children (17 years and under) have never been to an optometrist to have an eye examination.
- 44 per cent of children have not been to an optometrist to have an eye examination before their ninth birthday.

From https://journals.lww.com/apjoo/Fulltext/2016/11000/Epidemiology_of_Myopia.2.aspx

Outdoor Activity

Outdoor activity has recently been recognized as a protective factor for myopia. It may even overcome the risk factor of myopic parents if children spend enough time outdoors per week. A meta-analysis showed that more time spent on outdoor activities was associated with lower odds of myopia. The odds of myopia decreased by 2% for every additional hour of time spent outdoors per week.¹²¹

The mechanism through which outdoor activity can help prevent the onset of myopia is still unclear.

Brighter light might be a possible mechanism to protect against myopia.^{122,123} The “light-dopamine” theory is accepted as a possible mechanism. Increased light intensity during time spent outdoors can stimulate the retina to release dopamine, which could inhibit axial elongation of the eyeball.^{124–126} Myopia protection seems to be mainly from visible light, not UV light. Therefore, myopia prevention from time spent outdoors should be compatible with avoidance of UV exposure.

The outdoor activity, effective duration, frequency, and light intensity are still under investigation. There may be a threshold of 10 to 14 hours spent outdoors per week to prevent myopia onset.^{120,127} Intermittent bright light suppresses myopia more than continuous bright light in chickens.¹²⁸ A randomized trial of schoolchildren in China showed that 40 minutes per day of outdoor activity decreased myopia onset by 9% after 3 years. In Taiwan, an interventional study showed that 80 minutes per day of intermittent outdoor activity decreased myopia onset by 9% after 1 year.

CONCLUSIONS

The tide of myopia is coming along with the consequences it will bring. Not only is the treatment of myopia complicated, but also prevention is more important. Although the mystery of myopia is still shrouded, evidence-based medicine helps us more clearly identify the risk factors, protectors, and treatments. **Outdoor activity is a simple, free, and effective method to prevent myopia onset. Widespread outdoor activity is recommended to overcome the large amount of near work in the coming era of handheld devices.** Low-concentration atropine and orthokeratology make school myopia controllable. Anti-vascular endothelial growth factor is becoming the choice for myopic CNV treatment. However, there are still many incurable myopia complications. Epidemiology shows us that myopia has become the leading irreversible cause of blindness in East Asian countries, and it will be in more countries in the future. Intercountry organizations for eye health, such as the World Health Organization or Asia-Pacific Academy of Ophthalmology, are encouraged to raise awareness of the threat of myopia and organize committees to establish guidelines for myopia prevention and treatment

Further references

- 1 Jones LA, Sinnott LT, Mutti DO, et al. Parental history of myopia, sports and outdoor activities, and future myopia. *Invest Ophthalmol Vis Sci.* 2007;48:3524–3532.
 2. Sherwin JC, Reacher MH, Keogh RH, et al. The association between time spent outdoors and myopia in children and adolescents: a systematic review and meta-analysis. *Ophthalmology.* 2012;119:2141–2151.
- . French AN, Ashby RS, Morgan IG, et al. Time outdoors and the prevention of myopia. *Exp Eye Res.* 2013;114:58–68.

The best and most beautiful things in the world cannot be seen or even touched – they must be felt with the heart.

– **Helen Keller**

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