

# Physical exercise and glaucoma: a review on the roles of physical exercise on intraocular pressure control, ocular blood flow regulation, neuroprotection and glaucoma-related mental health

Zhu MM (1) , Lai JSM (1) , Choy BNK (1) , Shum JWH (1) , Lo ACY (1) , Ng ALK (1) , Chan JCH (1) , So KF (1,2,3,4)

1 Department of Ophthalmology, LKS Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China.

2 School of Biomedical Sciences, LKS Faculty of Medicine, The University of Hong Kong, Hong Kong SAR, China.

3 State Key Laboratory of Brain and Cognitive Sciences, The University of Hong Kong, Hong Kong SAR, China.

4 GHM Institute of CNS Regeneration, Ministry of Education CNS Regeneration Collaborative Joint Laboratory, Jinan University, Guangzhou, China.

The benefits of physical exercise on health and well-being have been studied in a wide range of systemic and ocular diseases, including glaucoma, a progressive optic neuropathy characterized by accelerated apoptosis of retinal ganglion cells (RGCs) . Elevated intraocular pressure (IOP) and insufficient ocular perfusion have been postulated to be the two main theories in glaucoma development and progression. The effects of exercise in these two aspects have been demonstrated by numerous researches. A review in 2009 focusing on these two theories concluded that exercise results in transient IOP reduction but an inconsistent elevation in ocular perfusion. However, the majority of the studies had been conducted in healthy subjects.

Over the past decade, technological advancement has brought forth new and more detailed evidence regarding the effects of exercise. Moreover, the neuroprotective effect of exercise by upregulation of neurotrophin and enhancement of mitochondrial function has been a focus of interest. Apart from visual impairment, the mental health issues in patients with glaucoma, which include anxiety and depression, should also be addressed. In this review, we mainly focus on publications from the recent years, so as to provide a comprehensive review on the impact of physical exercise on IOP, ocular perfusion, neuroprotection and mental health in patients with glaucoma.

Acta Ophthalmol. 2018 Jan 16. doi: 10.1111/aos.13661.

<http://www.ncbi.nlm.nih.gov/pubmed/29338126>