

Objective Measurement of Photopic Illuminance Rate in Daily Life of Progressive Myopic Children

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Purpose: To compare the percentages of photopic, high mesopic and dark illumination conditions in progressive myopic children.

Method: The Visual Behaviour Monitor (VBM) is a wearable sensor system which helps doctors and patients understand reasons for myopic progression in an objective and non-obtrusive way. Patients with myopic progression of more than 1 diopters in a year were included in the study. Participants underwent VBM training by research personnel. After training, participants used the VBM during their daily routine for 3-5 days (e.g. at home, in the school, hobbies). Doctors accessed the data reports via a web-based interface. Progressive myopic children were advised to use the VBM for at least 3 days. All data were analyzed. In the study, photopic illuminance was defined above 50 lux, high mesopic illuminance was 10-50 lux and dark illuminance was below 10 lux. Factors that may be effective in progression in myopia patients and possible solutions were investigated.

Results: Mean age of myopic children is 11.4 ± 2.7 years. Mean percentage of photopic illuminance (outdoor activities and high light) of total patients was 15%, mean percentage high mesopic illuminance (indoor activities) was 61% and mean percentage of dark illuminance 23%. Twenty seven of 30 patients had mean percentage less than 25% of photopic illuminance in their daily activities.

Conclusion: Outdoor high light intensity may protect progression of myopia. Our study showed that photopic illumination rate is very low in progressive myopic children. Environmental factors can be modified to protect progression of myopia.