

**Literature review: light and colour in myopia control**

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**References (if any):****Aims / Purpose:**

The mechanism for the benefit from time outdoors at reducing the risk of myopia is not fully understood. The intensity and breadth of spectrum of outdoor light is likely to be relevant. Interventions based on light of different chromaticities to slow myopia progression are of increasing interest. A narrative review is presented that aims to assess the efficacy, effectiveness, and safety of myopia control interventions using violet light (VL); blue light (BL); and repeated low-level red light (RLRL).

**Methods:**

A comprehensive literature search was undertaken for publications in English, evaluating the efficacy and safety of VL, BL and RLRL in human myopia control. Randomised controlled trials (RCTs) were prioritised but observational (non-RCT) studies were included enabling evaluation of effectiveness and safety of interventions in real-world clinics. Outcomes are changes in spherical equivalent refraction (SE) and/or axial length elongation (ALE).

**Results:**

26 relevant publications were found. The literature is suggestive of a benefit from VL. Studies on RLRL reveal significant treatment effects. In most RLRL studies, control groups did not receive a sham

control intervention, hence not controlling for placebo effects. Data concerning long-term follow-up are not available. Importantly, safety concerns have recently been raised, indicating that RLRL devices exceed maximum permissible exposure.

### **Conclusions:**

Additional studies are needed to determine whether VL plays a key role in myopia progression and whether associated interventions are safe and effective. There is more evidence supporting the efficacy of RLRL in myopia control, but important safety concerns recently raised mean that these devices cannot be endorsed.