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REVIEW

## The Utility of Virtual Reality in Ophthalmology: A Review

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**Abstract:** Virtual reality (VR) has been implemented in multiple facets of healthcare and the study of medicine. In the field of ophthalmology, VR facilitates surgical and non-surgical training while assisting in diagnosis and treatment. Our goal was to explore the applications and feasibility of VR in ophthalmology. We performed a search of the literature on the journal database PubMed using keywords relevant to VR integration in ophthalmological medicine. We included articles published since 2015 in this review of literature. The literature search yielded extensive applications of VR in medical training, as well as techniques for efficient diagnosis and screening using VR models including Eyesi and HelpMeSee. VR training simulators have decreased surgical error rates and improved technique in cataract surgery. In vitreoretinal surgery, a VR vitreoretinal training simulator resulted in improved surgical performance in both training and experienced surgeons. VR is also utilized in non-surgical training through an app to develop funduscopy skills and slit-lamp training for medical students. Additionally, VR is used in diagnosis, screening, and treatment of glaucoma, amblyopia, and strabismus. VR has also improved visual field defects in patients with glaucoma and treated amblyopia in children who did not improve with patching. Barriers to the widespread implementation of VR include high initial capital cost, limited sample sizes for research studies, and discrepancies between VR visual field and real-world clinical practice. Future research in streamlining VR methods to be more accessible and cost-effective has the potential to overcome these challenges. With further investigation into the logistics of VR applications, this technology could improve surgical outcomes and diagnostic accuracy.

**Keywords:** virtual reality, ophthalmology, cataract surgery, vitreoretinal surgery, amblyopia, glaucoma

[LINK](#)

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