INNOVAPATH™
The Premier Journal Bridging Discovery & Innovation

Letter to the Editor
https://doi.org/10.63501/7p1dd227

Virtual Reality Perimetry versus Conventional Perimetry: Balancing Patient Comfort and Reliability

Erum Habib, BS[1], Syeda Noor Us Saba, MBBS[2], Ariba Asif, MBBS[3]

[1]Department of Ophthalmology and Visual Sciences, Dow University of Health Sciences, Ojha Campus, University Road, Near SUPARCO, Gulzar-e-Hijri, 75300, Karachi, Pakistan

[2]Resident Ophthalmology, Al Shifa Trust Eye Hospital, Khyber Medical University, Peshawar.

[3]King Edward Medical University, Lahore

[1]Corresponding Author Email: erumhabib131@gmail.com

Dear Editor,

Perimetry is used to assess the visual field, using kinetic or static stimuli to evaluate retinal sensitivity and detect the visual pathway to light stimuli (1). Perimetry remains a cornerstone in the diagnosis and monitoring of glaucoma and other optic neuropathies. While conventional automated perimetry, such as the Humphrey Visual Field Analyzer, has long been considered the gold standard, its limitations include patient discomfort, fatigue, and reduced compliance during repeated testing. These factors often compromise test reliability, leading to variable outcomes that can obscure true disease progression (2).

Recent advances in virtual reality (VR) technology have introduced portable head-mounted perimetry devices that simulate visual field testing in an immersive and controlled testing environment, reduce testing times, increase portability, and improve accessibility, particularly for patients in underserved or far-flung areas (1). Studies report that patients generally find VR perimetry more comfortable, with the potential to create more dynamic and interactive testing experiences with reduced physical strain and less need for frequent repositioning (3,4). Importantly, the portability of VR platforms may also enhance accessibility in community and low-resource settings.

However, VR perimetry looks promising and useful; there are still ongoing doubts and concerns regarding reliability and standardization. While early trials show good correlation with conventional perimetry, discrepancies remain in detecting subtle defects, test–retest variability, and long-term reproducibility (5), further complicating its interpretation, raising questions about its consistency in routine monitoring of progressive diseases such as glaucoma. Moreover, when evaluated for glaucoma screening and general visual field assessment, only a limited number of VR-based devices have demonstrated a strong correlation with the established gold standard, suggesting that device-specific variability is a significant challenge (6). Integration of VR perimetry into clinical practice will therefore require not only rigorous methodological validation and standardization of protocols, but also the development of robust normative datasets, assessment of cost-effectiveness, and evaluation of its acceptance among patients and clinicians. If these barriers are adequately addressed, VR perimetry could evolve into a viable alternative to conventional visual field testing, especially in resource-limited or community-based screening settings.

https://doi.org/10.63501/7p1dd227

In conclusion, VR-based perimetry holds potential to improve patient experience and expand access to visual field testing. Nonetheless, until robust evidence confirms equivalence in reliability to conventional ones, VR systems should be considered complementary rather than replacements. Continued research is needed to establish their role in routine ophthalmic practice.

REFERENCES

1. Selvan K, Mina M, Abdelmeguid H, Gulsha M, Vincent A, Sarhan A. Virtual reality headsets for perimetry testing: a systematic review. Eye. 2024 Apr;38(6):1041–64.
2. Slagle GT, Groth SL, Donahue SP, Sponsel WE. Virtual reality perimetry facilitates visual field evaluation in a previously non-assessable eye with severe glaucoma. Am J Ophthalmol Case Rep. 2025 Dec 1;40:102430.
3. Wroblewski D, Francis BA, Sadun A, Vakili G, Chopra V. Testing of visual field with virtual reality goggles in manual and visual grasp modes. BioMed Res Int. 2014;2014:206082.
4. Tsapakis S, Papaconstantinou D, Diagourtas A, Droutsas K, Andreanos K, Moschos MM, et al. Visual field examination method using virtual reality glasses compared with the Humphrey perimeter. Clin Ophthalmol Auckl NZ. 2017;11:1431–43.
5. Jones PR, Smith ND, Bi W, Crabb DP. Portable Perimetry Using Eye-Tracking on a Tablet Computer—A Feasibility Assessment. Transl Vis Sci Technol. 2019 Feb 5;8(1):17.
6. Chen YT, Yeh PH, Cheng YC, Su WW, Hwang YS, Chen HSL, et al. Application and Validation of LUXIE: A Newly Developed Virtual Reality Perimetry Software. J Pers Med. 2022 Oct;12(10):1560.

ACKNOWLEDGMENTS

Author contribution statement

E.H: Conceptualization, Methodology, Software, Data curation, Writing Original draft preparation, Reviewing and Editing; **S.N.U.S:** Writing Original draft preparation, Reviewing, and Editing; **A.A:** Writing Original draft preparation, Reviewing, and Editing.

STATEMENTS AND DECLARATIONS

Declaration of conflicting interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding statement

The authors received no funding.

Ethical approval and informed consent statements

Not applicable

Data availability statement

https://doi.org/10.63501/7p1dd227

This article is based on previously published studies; no new data were generated.

Use of generative AI and AI-assisted technologies

No AI or AI-assisted technologies were used in the preparation of this manuscript.

Clinical trial registration

Not applicable.

Consent for publication

Consent for publication is not applicable as this study involves publicly available data.

Ethics, Consent to Participate, and Consent to Publish declarations:

Not applicable.

Acknowledgements

Not applicable.

Provenance and peer review

Not commissioned, externally peer-reviewed.