



## EDITORIAL

# Oculomotor Dysfunctions: Evidence-Based Practice Disfunciones Oculomotoras: Práctica basada en la evidencia



David P. Piñero (PhD)<sup>a,b,\*</sup>

<sup>a</sup> Department of Optics, Pharmacology and Anatomy, University of Alicante, Alicante, Spain

<sup>b</sup> Department of Ophthalmology, Vithas Medimar International Hospital, Alicante, Spain

Different authors are promoting in last years the concept of evidence-based practice in Optometry as a crucial tool to optimize treatments and procedures,<sup>1–4</sup> and to avoid the widespread of pseudo-therapies.<sup>5</sup> This is promoted by educators<sup>6</sup> and facilitated by the increase in scientific production in most of Optometry topics. This increase in research should be constant, with well-designed and focused studies, facilitating a continuous update of clinical protocols. However, this has not happened in all optometric areas. For example, research on vision therapy has experienced an irregular evolution, with the timeframe 1987-1983 containing the greatest number of scientific articles published.<sup>7</sup> Indeed, the limited evidence of quality on some aspects of vision therapy is one of its main criticisms of some professionals. However, there are conditions in which evidence supports the treatment with vision therapy, such as convergence insufficiency or some accommodative dysfunctions.<sup>3</sup> Recommendations defined according to the results of clinical trials are being adopted since years ago, leading to an entrenchment of evidence-based practice in vision therapy.

Regarding oculomotor anomalies, there is evidence of enough quality supporting the rehabilitation of oculomotricity in some neurological disorders, such as mild traumatic brain injury or concussion, with defined patterns

of saccadic and pursuit movement alterations.<sup>8</sup> Likewise, differences in some oculomotor aspects have been found among healthy children and children with specific learning disorders that does not necessarily implies a clinically relevant effect. However, there is a concern regarding the diagnostic methodology of oculomotor anomalies in this population, as no clear range of normality for the parameters used to characterise ocular motility has been identified and no gold standard or reference test has been defined.<sup>9</sup> Likewise, the oculomotor anomaly cannot be identified as an etiological factor for the learning disorders, as they are neuro-developmental anomalies, being this oculomotor alteration possibly a consequence.<sup>9</sup> Some case series and non-randomized comparative studies have reported some improvements in visual parameters after applying vision therapy in learning disorders, such as dyslexia or dyspraxia, but more research is needed to provide a consistent basis for the application of vision therapy in these patients as well as to characterize the real impact of the treatment on the their quality of life.

Besides neurological alterations and specific learning disorders, functional problems of oculomotricity may be present in healthy subjects, with the potential of affecting reading and even to academic performance. However, this needs to be confirmed in well-designed scientific studies. First, a characterization and standardization of the diagnostic criteria of oculomotor disorders must be performed, as previously done with non-strabismic binocular vision and accommodative disorders.<sup>10</sup> Our clinical decisions cannot be based on subjective or personal impressions. Once these diagnostic criteria are defined, consistent randomized clin-

\* Corresponding author. Department of Optics, Pharmacology and Anatomy. University of Alicante, Crta San Vicente del Raspeig s/n 03016, San Vicente del Raspeig, Alicante, Spain, Tel.: +34-965903500; fax: +34-965903464.

E-mail address: [david.pinyero@ua.es](mailto:david.pinyero@ua.es)

ical trials can be conducted to assess the benefit of vision therapy in these conditions over placebo, even if oculomotor anomalies are associated to binocular or accommodative disorders. Likewise, the real impact of oculomotor training in patients' dailies activities should be investigated further to provide realistic expectations to our patients.

In conclusion, more research is needed on oculomotor dysfunctions and their treatment with vision therapy to obtain accurate recommendations for the development and implantation of an evidence-based practice in this optometric area. Thus, pseudo-therapies promising miraculous results (even the potential resolution of neurological pathologies), professional intrusion and a degradation of the image of this area of the optometric professional activity will be avoided.

## Disclosure

The author has no proprietary or commercial interests to disclose

David P Piñero is supported by the Ministry of Economy, Industry and Competitiveness of Spain within the program Ramón y Cajal, RYC-2016-20471.

## References

1. Twa MD. Implementing Evidence-based Clinical Practice in Optometry. *Optom Vis Sci.* 2019;96:539–541.
2. Elliott DB. Evidence-based optometry and in-practice research. *Ophthalmic Physiol Opt.* 2012;32:81–82.
3. Piñero DP. Science-based vision therapy. *J Optom.* 2016;9:203–204.
4. Anderton PJ. Implementation of evidence-based practice in optometry. *Clin Exp Optom.* 2007;90:238–243.
5. González-Méijome JM. Science, Pseudoscience. *Evidence-Based Practice and Post Truth.* *J Optom.* 2017;10:203–204.
6. Suttle CM, Challinor KL, Thompson RE, Pesudovs K, Togher L, Chiavaroli N, Lee A, Junghans B, Stapleton F, Watt K, Jalbert I. Attitudes and barriers to evidence-based practice in optometry educators. *Optom Vis Sci.* 2015;92:514–523.
7. Ruiz-Pomeda A, Álvarez-Peregrina C, Povedano-Montero FJ. Bibliometric study of scientific research on optometric visual therapy. *J Optom.* 2020, <https://doi.org/10.1016/j.optom.2019.12.007>.
8. Kapoor N, Ciuffreda KJ. Assessment of Neuro-Optometric Rehabilitation Using the Developmental Eye Movement (DEM) Test in Adults With Acquired Brain Injury. *J Optom.* 2018;11:103–112.
9. Bilbao C, Piñero DP. Diagnosis of Oculomotor Anomalies in Children With Learning Disorders. *Clin Exp Optom.* 2019 Dec 23, <http://dx.doi.org/10.1111/cxo.13024>. Online ahead of print.
10. Cacho-Martínez P, García-Muñoz A, Ruiz-Cantero MT. Is There Any Evidence for the Validity of Diagnostic Criteria Used for Accommodative and Nonstrabismic Binocular Dysfunctions? *J Optom.* 2014;7:2–21.