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EDITORIALS

Treating reading difficulties with colour

UK dyslexia charities should present a more balanced view

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Around 3-6% of children in the United Kingdom have substantial difficulties learning to read, a condition often referred to as dyslexia. They are at high risk of educational underachievement. In a 1996 editorial in *The BMJ*, Margaret Snowling argued that dyslexia is a verbal (not a visual) disorder.¹ An accumulation of evidence supports this position and shows that reading difficulties are best dealt with by interventions that target underlying weaknesses in phonological language skills and letter knowledge.² The 2009 Rose report, which provides guidance for professionals in schools on identifying and teaching young people with dyslexia and reading difficulties, stresses the importance of early, phonological interventions.³

Despite this evidence, dyslexia is often associated with subjective experiences of visual distortions that lead to discomfort during reading (sometimes termed visual stress). It has been argued that these symptoms can be alleviated by using coloured overlays and lenses.⁴ Symptoms of visual stress are not unique to dyslexia, and proponents do not claim that the use of colour directly addresses the underlying cause of the reading difficulty. However, they argue that the reduction in visual distortion brought about by a change in colour can improve reading accuracy and fluency.⁴

A 2008 systematic review examined eight randomised controlled trials of coloured overlays and lenses for reading difficulties.⁵ All studies had serious limitations that weaken any conclusions drawn, including small sample sizes, inadequate control groups, inadequate reporting of randomisation methods, high levels of attrition, and short follow-up. The report concluded that the use of coloured filters did not lead to a clear improvement in reading ability or symptoms of visual stress in people with reading disability.⁵

A more recent systematic review evaluated a range of interventions and again concluded that the evidence base does not support the use of colour in the management of reading difficulty. When the experimental group was compared with a placebo control group the treatment effects were negligible.⁶ There are no validated diagnostic tests for visual stress and the symptom complex is vague, including frequent blinking, losing

one's place on the page, and "eye strain." Nevertheless, coloured overlays and lenses have become widespread in classrooms and higher education institutions as a core part of the remediation for reading difficulty.⁷ Measures of visual stress are often included in dyslexia screening tests.⁸ The number of students using this type of treatment is not known, but a recent study suggested that 56% of a sample of university students with dyslexia were currently using, or had previously been exposed to, coloured overlays and lenses.⁷

Possible reasons for this widespread use include uncritical reporting in the media and the lack of a body equivalent to the National Institute for Health and Care Excellence (NICE) reviewing the evidence base for educational interventions. Another important factor is endorsement from dyslexia charities.

National charities promoting the interests of children and adults with dyslexia are often the first port of call for affected individuals and parents. These charities offer a valuable source of information about dyslexia and its management. We have reviewed information on the use of overlays and tinted lenses provided by the websites of prominent dyslexia charities, eight in the UK and three in other English speaking countries.

Six of the eight UK charities provided information about coloured overlays and lenses in dyslexia. In all six cases, the message was one of endorsement, and the conflicting evidence base was not discussed.

The three overseas charities presented a different picture. Dyslexia Ireland includes the use of overlays under the section on alternative or complementary therapies.⁹ The International Dyslexia Association and Specific Learning Difficulties Australia both provide links to academic websites that take a sceptical view of the existence of visual stress and treatment with overlays.

Advice issued by the professional bodies whose members encounter children and adults with reading difficulties also does not support the use of colour. A recent joint statement from the American Academy for Pediatrics, Council for Children with Disabilities, American Academy of Ophthalmology, American

Association for Pediatric Ophthalmology and Strabismus, and the American Association of Certified Orthoptists concluded that “scientific evidence does not support the efficacy of . . . special tinted filters or lenses in improving long term educational performance.”¹⁰ Similarly, a review prepared on behalf of the Royal College of Ophthalmologists concluded that “manipulation of the visual system using colour to facilitate reading lacks scientific support.”¹¹

It is concerning that so many UK dyslexia charities are giving an inaccurate account of the evidence for the use of coloured lenses and overlays for managing reading difficulties. Consensus statements from influential bodies,¹⁰ rigorous systematic reviews,^{5 6} and recent trials do not seem to have influenced the advice. People using these websites could be persuaded to spend large amounts of money on precision tinting systems or expect the NHS to support this.

Dyslexia charities have an important role in presenting constructive and helpful messages to people with dyslexia and their educators. Our observation does not detract from the positive role of these charities—advice on coloured overlays and lenses is only a small part of the information provided. However, an evidence based approach from UK dyslexia charities educated by good science would enable the public to make a more informed choice.

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