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Research Paper

Exploring the Impact of Colours on Individuals with Reading Disabilities!

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ABSTRACT

The following research article aims to study the effects of using colours as an intervention with individuals who have reading disabilities. With the help of keywords such as "Colour overlays", "Coloured lens", "Reading disability", "Meares-Irlen Syndrome", "Dyslexia" etc studies were screened through various databases like "PubMed", "Google Scholar", "Science Direct" etc to look for the effect of colours on reading disabilities. 11 studies were selected that showed positive effect of use of colours in the form of tinted lenses or coloured overlays or coloured filters etc on individuals that suffered any kind of reading problems. It is also concluded that this area of study requires more researches to be conducted based on the limited studies that were available.

Keywords: *Colour, Dyslexia, Meares-Irlen, Reading Disability*

Reading is a complex task that is comprised of several sub- skills such as fluency, phonological awareness, phonics, vocabulary, and comprehension (Shaywitz & Shaywitz, 2005). More than 80% of pupils who have been identified as having learning disabilities have a reading difficulty, making it the most prevalent. Due to poor phonological ability and sluggish oral language processing speed, students with reading disabilities (RD) in particular struggle with reading fluency (Lee & Yoon, 2016). Repeated reading is frequently combined with additional interventions, including passage preview, systematic error correction (SEC), and performance feedback, and has been recognised as the most frequently suggested method to increase reading fluency for kids with reading disabilities (Lee & Yoon, 2016). According to the study by Lee and Yoon (2016) the Repeated Reading therapies were expected to improve reading fluency for kids with reading disabilities. The current results showed that Repeated Reading had a good impact on reading fluency improvements for students with reading disabilities, particularly in elementary school levels, which supported this assumption.

Despite receiving enough training and having average intelligence, dyslexia is a form of particular learning disability that impacts reading abilities such as fluency, accuracy, and understanding (*APA Dictionary of Psychology*, 2013). Dyslexics could struggle with spelling and writing as well. Research suggests that dyslexics may have trouble processing visual information, especially colour, which may contribute to their reading issues

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(Vidyasagar & Pammer, 2010). As a result, there is a growing interest in how colours influence those who have dyslexia in order to understand how visual processing may be related to reading difficulties.

The way we feel, act, and perceive the environment is significantly influenced by colours, which also have a favourable or negative impact on education. Because they can aid students in understanding and remembering material, colours are commonly employed in education. It has been found that including colour into courses enhances recall and comprehension. A study conducted by Kriss and Evans (2005) suggest that compared to non-dyslexic kids, children with dyslexia appear to gain more from coloured overlays.

Meares-Irlen Syndrome is a perceptual or visual dysfunction that results in reading difficulties. Formerly referred to as Scotopic Sensitivity Syndrome or SSS (Altman, 2003). The term "coloured overlays" refers to a variety of coloured plastic sheets or filters, including peach, rose, goldenrod, grey, blue-grey, green, purple, yellow (Altman, 2003), and according to the research (Jakovljević et al., 2021) we can determine that the coloured overlay by Irlen is one of these tools. All ten of the participants in this experiment saw an improvement in their reading abilities and self-esteem as a result of their use. Additionally, there was a reduction in a number of physical symptoms that had made it difficult for children to concentrate and read material correctly. Eye strain and headaches were no longer a source of distraction for students. As a result, they were able to pay close attention to the instructor and the text.

A qualitative study on a “girl with dyslexia suspected to have Irlen syndrome, completely relieved by wearing tinted lenses” (Kusano et al., 2015) it was seen that the Without tinted glasses, the patient was unable to read. She was able to read at the right level with tinted lenses, indicating that her difficulties was caused by a problem with the processing of visual information. Not only this but according to research (Heine et al., 2016) It has been demonstrated that reducing the wavelengths of light that can irritate students can be accomplished by using coloured overlays or print out all course materials on coloured paper. (Uccula, Enna & Mulatti, 2014).

Based on a study (Park et al., 2012) to determine whether coloured filters are helpful for Meares-Irlen Syndrome patients who have reading problems, it was found that Coloured filters were successful in reducing visual symptoms and increasing reading speed in people who had trouble reading. In order to distinguish Meares-Irlen Syndrome from other ocular illnesses, it is critical to have a full awareness of the syndrome's distinctive symptoms. One of the most recent studies conducted on “The Effect of Colour Overlays on Reading Achievement among The Children with Irlen Syndrome” (Nasaruddin & Abdul Hakim, 2022) determined the impact of blue colour overlays on kids with learning problems who also had symptoms of Irlen Syndrome. This research resulted in demonstrating a significant improvement in reading score and reading time in Irlen Syndrome-symptomatic learning disabled children utilising blue colour overlays. According to this study, blue colour overlays helped improve reading comfort in kids with learning difficulties who also had indications of the Irlen Syndrome (Nasaruddin & Abdul Hakim, 2022).

According to Jakovljević et al. (2021) They think that this is just the start of this field of study. Given that they discovered a significant individual variance in the data set provided in this publication, the next step would be to attempt to modify each child's favourite colour. They do this in an effort to make reading simpler for dyslexic kids and kids who have

reading issues. Additionally, they intend to use machine learning techniques to determine which of the various factors (or parameter combinations) examined for the study provides the most accurate indication of whether a certain child belongs to the dyslexic or non-dyslexic group. This would be extremely helpful for dyslexia prevention and early detection. The study described in this text has important ramifications for enhancing reading skills in students with reading difficulties, especially dyslexia. It has been demonstrated that repeated reading therapies, coloured overlays, and filters are efficient interventions that improve reading fluency, speed, and comprehension. Future studies are advised to look into the individual variation in colour preferences and investigate the application of machine learning techniques to detect dyslexia and other reading difficulties. Small sample numbers, a lack of generalizability, and the need for additional research are, however, the limitations of these studies, which make it difficult to identify the ideal colour schemes for certain pupils. In order to provide equal access to efficient reading treatments for all pupils, it is also critical to take into account the price and accessibility of these interventions, as well as any possible adverse effects.

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Conflict of Interest

The author(s) declared no conflict of interest.

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