

EEG responses and Effects of Tinted Eyeglasses in elementary school students during visual span tasks

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Introduction : Attention is an important concern of occupational therapists since it is a prerequisite to most learning and a potentially disruptive factor in performance management. Perceptual cognition was given an impulse to dynamic process of receiving the environment through sensory impulse (especially color, visual, tactile) and translated those impulses into meaning based on previous environmental experience or learning.

Objective : To investigate how elementary school students changed attention skills and visual-spatial memory span using the Computerized Neurocognitive-function Test (CNT) and used Electroencephalogram(EEG) analysis method at each channel, according to color of lens.

Methods : The subjects were 30 children(15 boys and 15 girls) with no color blindness and intact cognitive function who 1-4 grade elementary school students live in Daejeon Metropolitan City, South Korea. CNT was measured total five times, when without tinted glasses and with red color, yellow color, blue color, black color tinted glasses. Analysis were made by measuring the amplitudes of five bands(alpha, beta, learning, stress, attention skill) of quantitative EEG, and were analyzed for each scores and genders and compared between color using One-way ANOVA, Independent samples T-test and Scheffe method.

Results : The result showed that relative power of alpha, beta relative, learning, attention wave ratio increased statistically significant. Activity of EEG during performance according to color of lens, comparing with and without tinted glasses, each 4 kind of a relative alpha, beta relative, learning, attention has focused all $P < .05$ level, the difference was statistically significant. Differences between colors were seen in both stress, attention of blue, black color and the score of response in male students.

Conclusion : Black color and blue color lens tinted glasses are expected to have a positive influence on attention skills and visual-spatial memory span. Activity of EEG during performance of attention skills and visual-spatial memory span increased according to color of lens, each 4 kind of a relative alpha, beta relative, learning, attention.

Contribution to the practice/evidence base of occupational therapy: The results of this study represents the foundation of the development of an based information that will be attending different situation of color environment for distractive-persons with Intellectual Disabilities.