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Electroencephalography as a Recording Method in Visual Photosensitivity

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Electroencephalography is a harmless recording technique (Rivera et al., 2023) employed in both clinical and research settings to obtain an electroencephalogram (EEG). It has been recognized as a gold method of brain electrical activity to discover structural or functional damage in people with or without a diagnosis of neurological disease such as epilepsy (Guerrero Aranda, 2020). As a result, methodologies for EEG recording are periodically updated and reviewed to ensure best practices (Kasteleijn-Nolst Trenité, 2012). Addressing the demands of emerging interdisciplinary research, this study details the methodology employed and the data analysis processes used to examine a group of young university students without epilepsy, aiming to identify brain activation responses triggered by graphic images in visual photosensitivity which is mainly related to a high perceptual sensitivity to lights (Fisher, 2022). The international 10-20 system for EEG electrode placement was used to record brain electrical activity from 21 electrodes, incorporating a Vision Test, Baseline Recording (BR), and Pattern Sensitivity Test (PST). Changes in brain electrical activity were analyzed using clinical and psychological approaches, focusing on detecting biomarkers of abnormalities during the recording process (BR, PST). Additionally, frequency analysis (Hz) and band power ($\mu V^2/Hz$) were evaluated, with special attention to delta (0.2-3.5 Hz), alpha (8-12.5 Hz), and gamma (30 90 Hz) bands following the PST period. The fast Fourier transform method was employed for this analysis. This work hypothesizes that graphic images with specific structural features may modify the normal brain electrical activity in young people with undiagnosed visual photosensitivity.

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