Neurofeedback for Anorexia-RelaxNeuron-Aimed in Dissolving the Root Neuronal Cause

Authors : Kana Matsuyanagi

Abstract : Anorexia Nervosa (AN) is a psychiatric disorder characterized by a relentless pursuit of thinness and strict restriction of food. The current therapeutic approaches for AN predominantly revolve around outpatient psychotherapies, which create significant financial barriers for the majority of affected patients, hindering their access to treatment. Nonetheless, AN exhibit one of the highest mortality and relapse rates among psychological disorders, underscoring the urgent need to provide patients with an affordable self-treatment tool, enabling those unable to access conventional medical intervention to address their condition autonomously. To this end, a neurofeedback software, termed RelaxNeuron, was developed with the objective of providing an economical and portable means to aid individuals in self-managing AN. Electroencephalography (EEG) was chosen as the preferred modality for RelaxNeuron, as it aligns with the study's goal of supplying a cost-effective and convenient solution for addressing AN. The primary aim of the software is to ameliorate the negative emotional responses towards food stimuli and the accompanying aberrant eye-tracking patterns observed in AN patient, ultimately alleviating the profound fear towards food an elemental symptom and, conceivably, the fundamental etiology of AN. The core functionality of RelaxNeuron hinges on the acquisition and analysis of EEG signals, alongside an electrocardiogram (ECG) signal, to infer the user's emotional state while viewing dynamic food-related imagery on the screen. Moreover, the software quantifies the user's performance in accurately tracking the moving food image. Subsequently, these two parameters undergo further processing in the subsequent algorithm, informing the delivery of either negative or positive feedback to the user. Preliminary test results have exhibited promising outcomes, suggesting the potential advantages of employing RelaxNeuron in the treatment of AN, as evidenced by its capacity to enhance emotional regulation and attentional processing through repetitive and persistent therapeutic interventions.

Keywords : Anorexia Nervosa, fear conditioning, neurofeedback, BCI

Conference Title : ICN 2024 : International Conference on Neurofeedback
Conference Location : Vancouver, Canada
Conference Dates : August 05-06, 2024