ABSTRACT

Anxiety is one of the mental disorders frequently experienced by college students, which can disrupt psychological balance, academic performance, and social interactions. This study aims to develop the Neurobliss application, a desktop software designed to facilitate the stimulation of alpha brainwaves through a combination of relaxation music and binaural beats. The audio stimulus is expected to enhance the activity of alpha waves (8–13 Hz), which are associated with a relaxed state, while simultaneously reducing the activity of beta waves that are commonly linked to stress and anxiety.

The stimulation process and brain monitoring are carried out using Muse EEG devices (Muse 2 and Muse S), which record the brain's electrical signals non-invasively. The recorded EEG data are exported in CSV format and subsequently processed using MATLAB. The data processing stages include filtering with a Band-Pass Filter (BPF) to isolate the relevant frequency range (0.5–60 Hz), conversion to European Data Format (EDF), signal decomposition using Independent Component Analysis (ICA) to eliminate artifacts such as eye and muscle movements, and spectral analysis via Fast Fourier Transform (FFT) to map the power distribution across the brainwave frequency bands (delta, theta, alpha, beta, and gamma).

The anticipated result is a significant increase in the power of alpha waves after the audio stimulus, which is expected to positively impact the reduction of anxiety. In this way, the Neurobliss application not only provides a technological solution for monitoring and analyzing EEG signals, but it is also envisaged as an alternative supportive intervention for managing mental health among college students.

Keywords: Binaural Beats, EEG, enhanced alpha, anxiety, Neurobliss.