

INFLUENCE OF BINAURAL RHYTHMS ON THE PSYCHO-EMOTIONAL STATE OF A HUMAN BEING

Kharchenko K. S., Lysenko K. V., Storozhenko I. P.

National University of Pharmacy, Kharkiv, Ukraine

alicewodson@gmail.com

Introduction. Binaural effect of acoustic waves is known for a long time. This effect occurs when the superposition of two acoustic waves with similar frequencies. The amplitude of such a wave varies with time periodically. This effect was called the binaural effect or the binaural rhythms. When a person with the usage of headphones listens to the two different pure-tone sine waves, both with frequencies lower than 1500 Hz, with less than a 40 Hz difference between them, his brain produces an auditory illusion. This illusion appears because of the fusion of these two waves. But these waves are electromagnetic waves. Robert Monroe, an American researcher, began to study binaural rhythms in the middle of the 20th century. Since then appeared the whole industry which persuades people that music with binaural rhythms has a positive influence on the mental health. The official label which uses the music with binaural rhythms is called **Hemi-Sync (hemispheric synchronization)**. There is a hypothesis that acoustic binaural beats lead to synchronization of the brain hemispheres. The beat frequency can determine the basic biorhythms brain frequency. However, there is no certain scientific evidence on the effect of the Hemi-Sync technology.

Aim. To study the influence of binaural rhythms on the psycho-emotional state of people.

Research Method. 18 volunteers between the ages of 16 to 60 took part in the experiment. They didn't have any mental disorders or physiological illnesses. They were asked to answer the questions before and after listening to the same piece of music with and without Hemi-Sync during the certain period of time (from 10 to 20 minutes). There were 8 questions in the questionnaire. To answer these questions volunteers had to rate their psychological state by the scale between -5 to +5. The results were analyzed by the Wilcoxon test. Wilcoxon test is a non-parametric statistical test used to compare two paired samples at the level of a quantitative trait measured in a continuous or ordinal scale. Processing of survey results conducted with a significance level of less than 0.05

Results and discussion. The research showed that music with Hemi-Sync has an influence on the psycho-emotional state of people. The influence was less in the control group where volunteers were asked to listen to the same piece of music

without Hemi-Sync. It can be seen by the average results in the groups. The differences between the states of volunteers before and after listening to music are much more visible in the experimental group. The psycho-emotional state has changed significantly in the control group on 4 criteria. And the psycho-emotional state has changed significantly in the experimental group on 7 criteria.

The differences were the highest in the answers to the questions number 3, 4 and 7. All changes were positive.

In the 3rd question volunteers were asked to say if they felt themselves more self-confident after listening to music. In the experimental group, their results increased by 1.72 points in average while in the control group it was just 0.83 points what less than the statistical error. In the 4th question volunteers were asked to note their change of mood. The average result in the experimental group was incredible 2.29 points while in the control group it was 0.94 points, which is close to the statistical error, too. In the 7th question volunteers were asked to rate their overall psychological state. 1.89 points was an average result in the experimental group and 1.44 points was an average result in the control group.

These results show that binaural rhythms in this piece music have a positive influence on emotional and psychological states of people.

Conclusions. Music with Hemi-Sync has a definite positive influence on the psycho-emotional state of people. This effect has to be studied more. It can be used as a method of the light mental impact.