

Exploring Neurofeedback as a Trauma Intervention

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Outline

- * Does neurofeedback help reduce symptomology in PTSD
- * How does neurofeedback compare to other treatments
- * What are best practices

Motivation for the Study

- * Seven million Americans suffer with PTSD
- * Causes debilitating impairment in family, social and productivity roles
- * Higher risk of suffering from depression, anxiety, alcohol and drug abuse, suicidality, phobias and panic disorder
- * Limited amount of studies examining neurofeedback to reduce trauma symptoms

Motivation for the Study

- * Current recommendations include medication, EMDR, cognitive therapies
- * Patients fail to recover 50% of the time
- * Imperative to learn if neurofeedback reduces PTSD symptoms in published research
- * How neurofeedback compares to other treatments
- * What are best practices in the field of neurofeedback for trauma treatment

Background Information

- * Participants in peer-reviewed studies were individuals diagnosed with PTSD using neurofeedback to address symptoms
- * Methods used critical realism in a thematic approach with a Hermeneutical analysis of the data
- * 12 articles were analyzed to learn if symptom reduction occurred
- * 215 participants total

Background Information

- * Two meta-analyses were used to compare neurofeedback, cognitive therapies, and EMDR
- * Neurofeedback was compared to medication using 28 randomized, controlled trials of 1,503 patients and another group of 40 Randomized Control Trials

Results

- * Research shows PTSD symptom reduction in 100% of studies examined
- * Cognitive therapies have a remission rate of 53% for PTSD participants
- * EMDR has a remission rate of 53% for PTSD participants

Results

- * Medication has a remission rate of 55% when administered for 36 weeks
- * Remission rates for neurofeedback were not recorded
- * Limited number of studies and methodology used to investigate neurofeedback brings into question generalizability

Research Design

- * Each of the studies approached the research differently
- * Three were case study designs and different types of neurofeedback were administered including Alpha/Theta, amplitude, real time fMRI neurofeedback, z-score training, and Flexyx neurofeedback. Also different protocols were administered

Discussion of the Findings

- * Neurofeedback can improve PTSD symptomology
- * Themes emerged including diagnoses, location, types of neurofeedback administered, protocols applied and number of sessions completed
- * Additional themes identified include: level of education for participants, marital status, number of children, no-shows, ethnicity, employment and income

Symptom Reduction After Neurofeedback

- | | |
|-----------------------------|-------------------------|
| * depression | executive functioning |
| * anxiety | calmness |
| * hyper-arousal | mood/emotion |
| * pain | auditory attention |
| * headaches | auditory vigilance |
| * nightmares | processing speed |
| * medication | visual processing speed |
| * improvement in well-being | cognition |
| * Fatigue | improved focus |
| * working memory | |

fMRI Measurements After Neurofeedback

- * Increased functional connectivity in salience network, middle insula, left posterior insula, bilateral superior temporal gyri, right MNI, left dAAC, and right inferior frontal gyrus
- * In the default network there was significant increases in functional connectivity with bilateral subgenual anterior cingulate, bilateral middle frontal gyri, and right MNI with a decrease to the right middle temporal gyrus.
- * These results illustrate renormalizing network oscillations and are associated with increased calmness

Medication Comparison

- * Medication in trauma care is shown to be cost-effective and efficacious
- * SSRIs are the first line of treatment with gold standard being sertraline. Sertraline and paroxetine are approved for treating PTSD

Medication Comparison

- * SSRIs are effective 55% of the time in creating remission when taken for 36 weeks however after
- * Discontinuation of paroxetine resulted in no clinically relapse
- * All of the literature reviewed demonstrated Neurofeedback was effective

Cognitive Therapies Comparison

- * Cognitive therapies are shown to bring patients to remission 53% of the time with cognitive processing therapy the gold standard delivered in 12 sessions
- * While neurofeedback literature demonstrates success 100% of the time, we do not have remission statistics and the research is not generalizable

EMDR Comparison

- * 53% of people who receive EMDR will no longer have PTSD after three months.

Best Practices

- * Research overall is not at a point where best practices have revealed themselves. This question cannot be answered until standardization occurs in the research.
- * Not enough information in the literature due to different types of neurofeedback administered, different protocols, gender imbalance and overwhelming number of Veterans in the literature.

Best Practices

- * Certain themes however did emerge: number of sessions, how many times per week neurofeedback takes place, and if patients were able to control the feedback signal.
- * Heart rate variability and diaphragmatic breathing may assist this process.
- * Therapeutic alliance is crucial in neurofeedback training.
- * Neurofeedback is changing cortical activity. The amplifier makes brain waves overt. It is the relationship that allows this to happen.

Best Practices

- * Patterns emerged in research regarding protocols
- * P4-T4 bipolar montage
- * Reducing alpha
- * Alpha/Theta training

- * These offer stabilization, a calming of emotional reactivity, common sense, physical calming, body and spatial awareness, sensory integration, orientation to time and space and mental calming

Best Practices

- * Neurofeedback in conjunction with other therapies, relaxation techniques before hand and a strong therapeutic alliance, protocols selected, number of sessions and how many times per week all begin the discussion for best practices

Recommendations for Future Research

- * Studies focusing on females. This research is heavily skewed toward males.
- * More cross cultural research needs to be conducted with men and women including different races, ethnicities and cultures
- * Future studies that examine neurofeedback in conjunction with other treatment modalities

Conclusion

- * This study presented a comparison of different types of PTSD therapies and how they compare with each other
- * This research begins a discussion about best practices in the field
- * This is important to not only end the commercial and political debate about neurofeedback but also to provide organization and standardization to offer full access of this therapy with the best possible outcome to patients

Conclusion

- * The lack of standardization has contributed to the debilitating debate about the legitimacy of the field
- * Lets continue the conversation about creating methodologically sound research with structure, standards, best practices and techniques

Thank you

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