

HRV BIOFEEDBACK AND SUBSTANCE CRAVINGS IN AN OUTPATIENT TREATMENT PROGRAM

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Purpose

The purpose of this research is to examine the effects of an HRV biofeedback (HRVB) intervention among individuals attending an outpatient Partial Hospitalization Program (PHP) or Intensive Outpatient Program (IOP) for substance abuse or co-occurring substance abuse and mental health disorders on self-report craving.

Methods

Participants

- Participants: 22 in the HRVB group and 21 in the TAU group
- Patients admitted to Alvarado Parkway Institute, Behavioral Health System (APIBHS) La Mesa Outpatient Partial Hospitalization Program (PHP)/Intensive Outpatient Program (IOP) with a primary or secondary diagnosis of substance use disorder

Measures

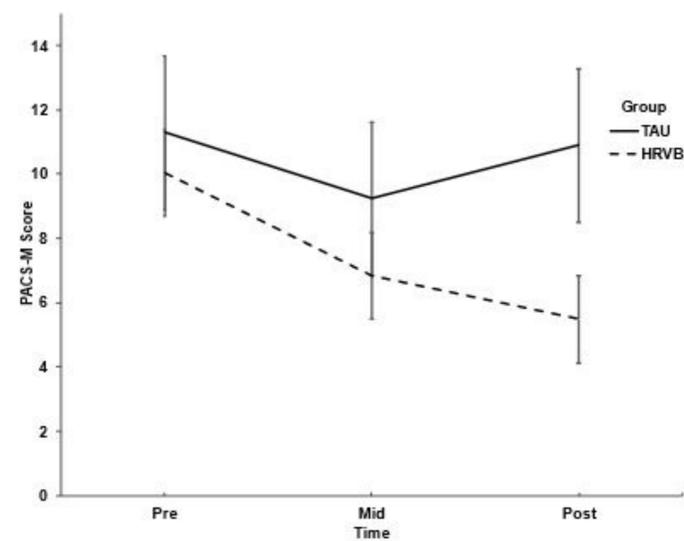
- Penn Alcohol Craving Scale-Modified (PACS-M) ($\alpha = 0.93$ in present sample) to assess alcohol or drug cravings

Procedure

- This cohort multiple RCT study was reviewed and approved by the Institutional Review Board at Alliant International University.
- The intervention portion of the study occurred over the course of five weeks with pre-, post- and follow-up data collection.
- Participants in the HRV biofeedback condition received five, once weekly biofeedback sessions.
- During the initial study visit, participants randomized to the biofeedback condition were provided with brief verbal psychoeducation about ANS and instruction to correctly implement slow diaphragmatic breathing.
- During subsequent study visits participants were asked to practice the technique for approximately 20 minutes at their rate of breathing daily.

Results

Cravings Scores as Measured by the PACS-M Across Time Through the Follow-up Period by Condition



Note. HRVB = Heart Rate Variability Biofeedback intervention group; TAU = Treatment as Usual comparison group; PACS-M = Penn Alcohol Craving Scale-Modified.

Results showed a statistically significant group by time interaction between groups for PACS-M scores ($F_{(2, 84)} = 4.09, p = .020, \eta_p^2 = .089$), indicating that the HRV biofeedback intervention group experienced a reduction in cravings significantly greater than the TAU group with a medium effect size (Cohen's $d = .625$) and power of .712.

Discussion

- Individuals attending outpatient treatment for substance abuse face unique challenges due to returning home at the end of each treatment day and possibly having access to their substance of choice, making relapse more likely during their treatment episode.
- Results appear to indicate a faster reduction of cravings among those receiving HRV biofeedback, which can be maintained over time. This is also consistent with prior findings indicating that the addition of HRV biofeedback can lead to a reduction in cravings faster than inpatient TAU alone (Penzlin et al., 2015).
- HRV biofeedback may be effective for reducing cravings because it teaches individuals to self-regulate their ANS activity, resulting in an increased sense of self-efficacy or improved interoceptive awareness, thereby reducing the experience of cravings and increasing their confidence in the ability to manage cravings as they arise.
- Taken together, these findings suggest that HRV biofeedback appears to be a particularly effective tool for reducing cravings among those with high craving severity.
- This is an important finding, as those with greater autonomic and HPA axis dysregulation are found to have higher rates of relapse (Milivojevic & Sinha, 2018), and cravings themselves are a significant contributing factor to substance abuse relapse (Sinha, 2013).

References

- Milivojevic, V. & Sinha, R. (2018). Central and peripheral biomarkers of stress response for addiction risk and relapse vulnerability. *Trends Mol Med*, 24(2), 173-186. doi: 10.1016/j.molmed.2017.12.010
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- Sinha, R. (2013). The clinical neurobiology of drug craving. *Current Opinion in Neurobiology*, 23(4), 649-654. doi:10.1016/j.conb.2013.05.001