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Substance craving changes in university students receiving heart rate variability biofeedback: A longitudinal multilevel modeling approach

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Highlights

- Over time, craving levels changed more within persons than between persons.
- Daily HRVB practice of >12 min produced larger craving reductions.
- Depressive symptoms more than the person's usual attenuated craving reductions.

Abstract

Background

Previously published findings from a study of university students living in substance use disorder (SUD) recovery housing showed an eight-session heart rate variability biofeedback (HRVB) intervention significantly reduced craving. That study, however, uncovered pronounced inter-participant variability in craving change patterns through the course of HRVB that warranted further exploration. The purpose of the current investigation was to examine how within- and between-person factors may have differentially influenced craving changes.

Methods

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Multilevel models of change were estimated to model craving trajectories and predictor relationships over time as a function of age, sex, length of abstinence, daily HRVB practice, anxiety, depression, and stress.

Results

A quadratic pattern of craving reductions was found, indicating that craving reductions accelerated over time for some participants. Daily HRVB practice of >12 min and older age significantly enhanced craving reductions over time. Increases in depressive symptoms attenuated the effects of HRVB on craving. The other predictors were not significantly associated with craving in this study. The true R^2 for the final model indicated that 20.5% of the variance in craving was explained by older age, daily HRVB >12 min, and within-person changes in depression.

Conclusions

HRVB shows promise as an accessible, scalable, and cost-effective complementary anti-craving intervention. Healthcare providers may help persons recovering from SUD to better manage substance craving by the routine and strategic use of HRVB practice.

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Keywords

Craving; Heart rate variability biofeedback; Substance use disorder; Longitudinal; Multilevel modeling

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