

## Dampened heart rate variability during passive biomonitoring in the real-world in individuals with Alcohol Use Disorder relative to social drinkers



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**DATA ANALYSIS** 

Separate models for sleep and wake hours

Hours since falling asleep or waking

Quadratic models were tested but were

all non-significant so remove from the

Averaged HRV measures were correlated

Multilevel mixed effects models with

crossed effects were used (R, Ime4,

ggplot2, ggeffects) Random effects included:

Intercept for day

Slope for time

with clinical measures

model

Intercept for person

Time was modeled as linear.

## **BACKGROUND**

- Chronic alcohol abuse can have profound effects on the cardiovascular system.
- Heart rate variability (HRV), or the fluctuations in heart rate, reflects the dynamic autonomic nervous system processes that change to meet biological demands and environmental challenges.
- Indices reflect the dynamic between parasympathetic activity and sympathetic activity. Higher values are generally thought to represent more parasympathetic activity.
- Lab studies have demonstrated that individuals with alcohol use disorder (AUD) have lower tonic HRV relative to healthy controls (Ralevski et al., 2019).
- In the current study, we examined if indices of HRV were altered in individuals with AUD relative to healthy controls and if these indices predicted clinical symptoms.

## **METHODS**

10 social drinkers and 16 individuals with AUD completed were recruited as part of a larger observational research study.

	Social	AUD
Demographic Characteristics		
N 0.	11	15
Gender – no. of females	5 (45.5%)	7 (46.7%)
White/Caucasian	8 (54.5%)	7 (46.7%)
Age <sup>a</sup>	3455 ± 12.43	35.44 ± 10.89
Years of Education <sup>a</sup>	15.86 ± 3.14	14.60 ± 2.35
Baseline Heart Rate <sup>a</sup>	28 (65.1%)	28 (52.8%)
Baseline SBP <sup>a</sup>	130.82 ± 15.93	132.4 ± 16.36
Baseline DBP <sup>a</sup>	70.64 ± 9.85	79.0 ± 14.14
Alcohol Use		
Years of alcohol use <sup>a</sup> *	3.73 ± 3.66	10.40 ± 8.76
Past 30 days alcohol use <sup>a</sup> *	8.73 ± 6.33	19.00 ± 7.83
Baseline average quantity <sup>a</sup> *	1.07 ± 0.26	2.3 ± 1.42
AUDIT Total Score <sup>a</sup> *	6.40 ± 4.55	18.93 ± 6.64
Clinical S	ymptoms	
Withdrawal (CIWA) <sup>a</sup>		5.74 ± 3.65
Craving (AUQ) <sup>a</sup>		2.64 ± 1.56
Depression (BDI) <sup>a</sup>		10.93 ± 11.15
Sleep problems (PSQI) <sup>a</sup>		9.53 ± 4.93
Anxiety (HAM-A) <sup>a</sup>		13.53 ± 7.16
HRV measurement		
Percentage of sleep hours per day *	79.97% ± 16.20%	72.13% ± 22.95%
Number of days	6.21 ± 2.99	6.14 ± 1.88
Data indicate means and standard deviati ifferences (p < 0.05).	ons. * indicates signific	ant group
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- differences (p < 0.05). Participants wore a Firstbeat Bodyguard 2 for 2-11 days as they went about their daily lives. • Uploaded to Firstbeat Lifestyle Assessment, which: • Sleep and waking hours • Calculated HF and LF/HF After downloading, calculated average
- HF/LF and HF for each hour in the study based on Firstbeat Lifestyle assessment.
- Calculated RMSSD and SDNN for each hour.





**CONCLUSIONS** 

- Recent advances in physiological devices allows for passive monitoring of HRV indices in the real world.
- The parasympathetic nervous system is dampened in treatment-seeking individuals with AUD during sleep compared to social drinkers.
- Waking parasympathetic activity predicted increases in alcohol withdrawal, depression, and sleep problems.
- Chronic dysregulation could underlie the previously observed increased risk for cardiovascular disease with chronic, heavy alcohol use.

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