

Supplementary Material

Article Title: The Association between Sleep Disturbances and Perceived Stress in Substance Use Disorder Treatment

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LIST OF SUPPLEMENTARY MATERIAL FOR THE ARTICLE

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Supplementary Appendix 1

Power and Effect Size

An a priori power calculation for the linear regressions assuming the sample size of 3,314 (due to subjects completing their first survey after the seventh day of treatment), attempting to detect a small effect ($f^2=0.02$) with significance level of 0.05 yielded power of 0.99.

The aim of this study is to determine if there are clinically meaningful differences between groups therefore, the standardized coefficient of groups with statistical significant interactions will be evaluated according to Cohen's guidelines with standardized β below 0.1 being too small to be clinically relevant [1-4].

To verify if our power was adequate to detect significant associations between predictor and outcome variables, we conducted mixed-effects analysis simulations for detecting a medium effect. According to Cohen's criteria, a medium effect corresponds to a standardized β between 0.30 and 0.49. In our simulations, we replaced each variable with a standardized β of 0.40 for main effects and 0.16 (the product of two main effects at 0.40) for the interaction. These simulations were executed 1,000 times using the *simr* package in the R programming language[5]. The results indicated insufficient power to detect a medium effect in the groups with primary substances being benzodiazepine or prescription stimulants. Consequently, these groups were excluded from the final analysis. For detailed power estimations, refer to the supplemental material.

Supplementary Table 1. Power Calculations as Percentages

		ISI_Total		Perceived Stress Scale	
Predictors		Estimates	CI	Estimates	CI
Alcohol		Ref.		Ref.	
Cocaine		93.3	98.56 -99.72	100	99.63-100
Heroin/Fentanyl		98.2	97.12-98.93	100	99.63-100
Marijuana		81.3	78.74-83.67	99	98.17-99.52
Methamphetamine		100	99.63-100	100	99.63-100
Prescription Opioids		99.6	98.98-99.89	100	99.63-100
		PSS		ISI	
Person Mean		93.5	91.79-94.95	93.4	91.68-94.86
Person Mean Centered		100	99.63-100	100	99.63-100
Days		100	99.63-100	100	99.63-100
Age		100	99.63-100	100	99.63-100
Gender	Women	Ref.			
	Men	98.1	97.05-98.85	99.9	99.44-100
	Other	98.1	97.07-98.85	99.9	99.44-100
Between Person Interactions		Substance * PSS Person Mean		Substance * ISI Person Mean	
Cocaine *		93	91.24-94.5	97.4	96.21-98.29
Heroin/Fentanyl *		93	91.24-94.5	96.9	95.63-97.88
Marijuana *		72.8	69.93-75.54	76.4	73.64-79.0
Methamphetamine *		98.5	97.54-99.16	99.5	98.84-99.84
Prescription Opioids *		93.4	91.68-94.86	100	99.63-100
Within Person Interaction		Substance * PSS Person Mean Centered		Substance * ISI Person Mean Centered	
Cocaine *		100	99.63-100	100	99.63-100
Heroin/Fentanyl *		54.9	54.77-60.98	100	99.63-100
Marijuana *		60.4	57.29-63.45	100	99.63-100
Methamphetamine *		100	99.63-100	100	99.63-100
Prescription Opioids *		100	99.63-100	100	99.63-100

bold - Indicates a value below 80%

References

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5. Green, P., MacLeod, C. J., & Simm, G., *simr: Power Analysis for Generalised Linear Mixed Models by Simulation.* 2019.