Feasibility of Ecological Momentary Assessment research among active illegal substance users with an untreated substance use disorder.

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SANPSY
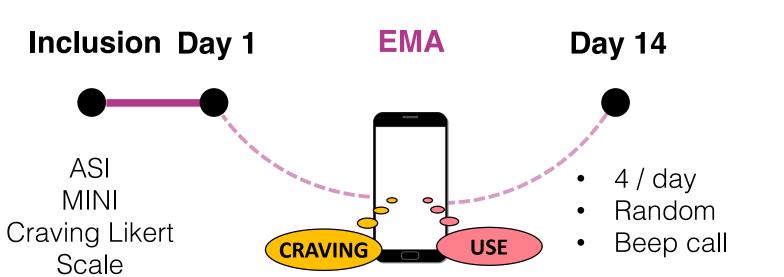BORDEAUX neurocampus

INTRODUCTION

Most **Ecological Momentary Assessment (EMA)** studies, including in addiction research, have been conducted among students or patients (Serre et al, 2015, Reichert et al, 2021). However, **active illegal substance users** with an **untreated substance use disorder (SUD)**, which tend to have greater precariousness and higher severity, are generally excluded from such research which limits generalizability (Freedman et al, 2006; Kirk et al,2013; Roth et al, 2017). **Craving**, unwanted intense urges to use substances, could play a role in this severity (Auriacombe et al, 2018). However, little is known about **the feasibility and validity of EMA method** in this population.
OBJECTIVE: To explore the feasibility, acceptability and validity of an EMA protocol to capture daily life craving and substance use among active illegal substance users with an untreated SUD by comparing with patients initiating treatment for SUD.

METHODS

Population with addiction (SUD DSM-5 criteria):
1) HR: Regular users of substances with an untreated SUD from Harm Reduction settings (from January 2019 to April 2023)
2) TTT: Patients initiating SUD treatment in an outpatient clinic (from December 2019 to April 2023)

Inclusion Day 1   EMA   Day 14

ASI
MINI
Craving Likert Scale

• 4 / day
• Random
• Beep call

CRAVING   USE

Since the last evaluation, have you felt *craving*?
1 2 3 4 5 6 7
No   Extremely

Since the last evaluation, have you *used (primary substance)*?
NO   YES

Legends:
ASI: Addiction Severity Index; Drug and Alcohol Interviewer Severity Score (ISR) (Denis, et al. 2016)
MINI: Mini International Neuropsychiatric Interview (Sheehan, et al. 1998)
Craving Likert Scale: past month mean and maximal intensities (0–10) (Lambert et al. 2022)
EMA: Ecological Momentary Assessment (see Serre et al. 2012; Fatseas et al. 2015)
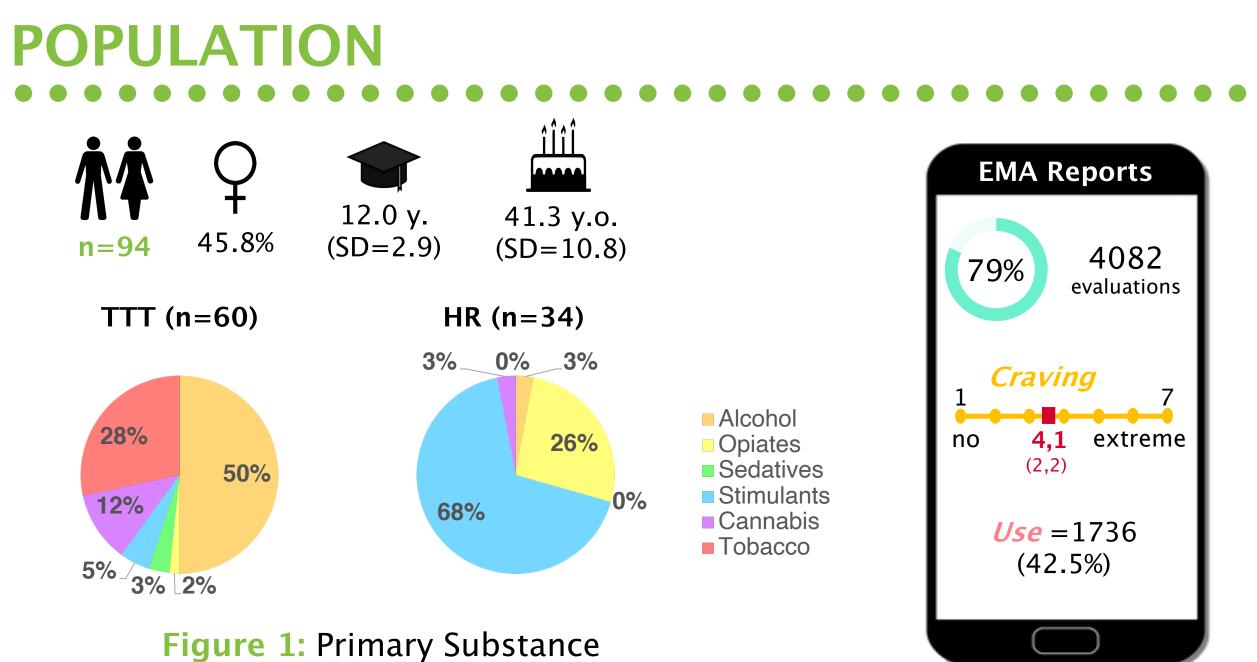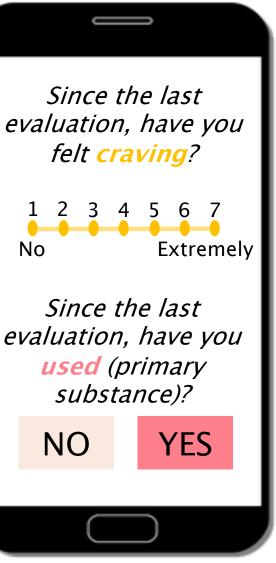
Variables:
• **Acceptance** = acceptance rates among all eligible participants
• **Compliance**= average response rate to the daily interviews (EMA)
• **Fatigue effect** = change in frequency of missing data as a function of time in study
• **Convergent validity** = concordance between ambulatory monitoring recorded data on craving and use with clinical measures of similar constructs or convergent assessment
• **Time-dependent effects** = changes in the frequency of reports of activity, social and environmental contexts as a function of time in the study.

Statistical analyses: *(Based on Serre et al. 2012)*
• **Compliance:** Wilcoxon test (z); Khi² of Pearson (χ²)
• **Time-dependent effects & Convergent validity:** Hierarchical linear and non-linear models (HLM)

POPULATION

n=94   45.8%   12.0 y. (SD=2.9)   41.3 y.o. (SD=10.8)

EMA Reports
79%   4082 evaluations

Craving
1 ... 4,1 ... 7
no   (2,2)   extreme

Use =1736 (42.5%)

TTT (n=60)
50% , 28%, 12%, 5%, 3%, 2%

HR (n=34)
68%, 26%, 3%, 0%, 0%, 3%

Alcohol
Opiates
Sedatives
Stimulants
Cannabis
Tobacco

Figure 1: Primary Substance

ACCEPTANCE & COMPLIANCE RATES

Populations	TTT	HR
Screened (n)	359	198
% Eligible (n)	50.70% (182)	25.25% (50)
Acceptance (% Included / n)	29.12% (53)	78.00% (39)
% Beginning the EMA protocol (n)	26.37% (48)	38.00% (19)
Minimum Compliance (% with enough data to be used in analysis; ≥ 30% of EMA completed / n)	91.67% (44)	78.94% (15)

Table 1: Acceptance rate and minimum compliance between populations (from 2021 to April 2023 only)

Participants who started the EMA	Total, n = 106	TTT, n = 64	HR, n = 42	Coef. (p-value)
Average compliance (SD)	72.75% (24.13)	76.25% (22.30)	67.41% (26.03)	z = -2.00 (0.046*)

Participants with usable data (≥ 30%)	Total, n = 94	TTT, n = 60	HR, n = 34	Coef. (p-value)
Average compliance (SD)	79.33% (15.24)	80.49% (15.15)	77.28% (15.40)	z = 1.26 (0.21)
Thresholds of compliance				
≥ 75%	70.21%	75.00%	61.76%	χ2 = 1.82 (0.18)
≥ 50%	92.55%	93.33%	91.18%	χ2 = 0.14 (0.70)

Table 2: Compliance rate in EMA between populations

TIME-DEPENDENT EFFECTS & CONVERGENT VALIDITY

TTT

Time-dependent effects	Coef.	SE	T ratio
Fatigue effect	-0.041	0.02	-1.738
Activity frequency			
Doing nothing	-0.012	0.03	-0.441
Working	0.001	0.03	0.064
Social interaction			
Alone	0.022	0.02	0.952
With family	-0.030	0.03	-1.173
Environmental context			
At home	0.028	0.03	1.085
At work	0.036	0.04	0.943

HR

Time-dependent effects	Coef.	SE	T ratio
Fatigue effect	<-.001	0.02	-0.008
Activity frequency			
Doing nothing	0.020	0.04	0.542
Working	0.118	0.04	2.933**
Social interaction			
Alone	0.028	0.03	1.059
With family	0.028	0.03	1.038
Environmental context			
At home	<.007	0.05	0.146
At work	0.120	0.03	4.038***

Table 3: **Time-dependent effects** among participants in TTT and HR populations in EMA

TTT

EMA variables	Clinical variables	Coef.	SE	T ratio
Craving	Craving Maximal Intensity	0.011	0.06	1.750
Craving	Craving Mean Intensity	0.010	0.06	1.707
Use	Addiction severity (ASI)	0.092	0.34	0.272

HR

EMA variables	Clinical variables	Coef.	SE	T ratio
Craving	Craving Maximal Intensity	0.021	0.22	0.222
Craving	Craving Mean Intensity	0.044	0.12	0.371
Use	Addiction severity (ASI)	-0.067	0.94	-0.385

Table 4: Convergent validity among participants in TTT and HR populations in EMA

*Legends: * p < 0.05; ** p < 0.01; *** p < 0.001*
All models are adjusted for age and sex

Figure 2: Graphic representation of **convergent validity** among participants in TTT and HR populations

DISCUSSION

Main results:
1) **Higher acceptance rate, lower minimum compliance rate** (usable data > 30%) but **comparable compliance rate in EMA** for participants who passed the minimum threshold **in HR compared to TTT population (50 and 75%).** However, compensation for taking part in the study (higher above 75% of questionnaires completed) may have influenced the completion rate, particularly for the HR population.
2) No significant fatigue effect was observed by day in the study. While the activities and **environmental categories examined did not vary by study duration**, reporting having worked (to be at work) increased over time for the HR population.
3) Convergent validity has not been demonstrated, but graphically, we can see a trend towards craving, especially in the HR population.
Limits: Differences in *primary substance* by population. Sample size was too small for analysis by *primary substance*.
Conclusion: Comparable compliance in HR than in TTT (Moderate 50% and High 75% compliance), EMA protocol seems feasible for assessing craving and use in people with untreated SUD; as it was highlighted in another TTT sample before (see Serre et al, 2012; Fatseas et al 2015)
Perspectives: Further studies may explore **the daily life link between craving and substance use** among active substances users with an untreated SUD.
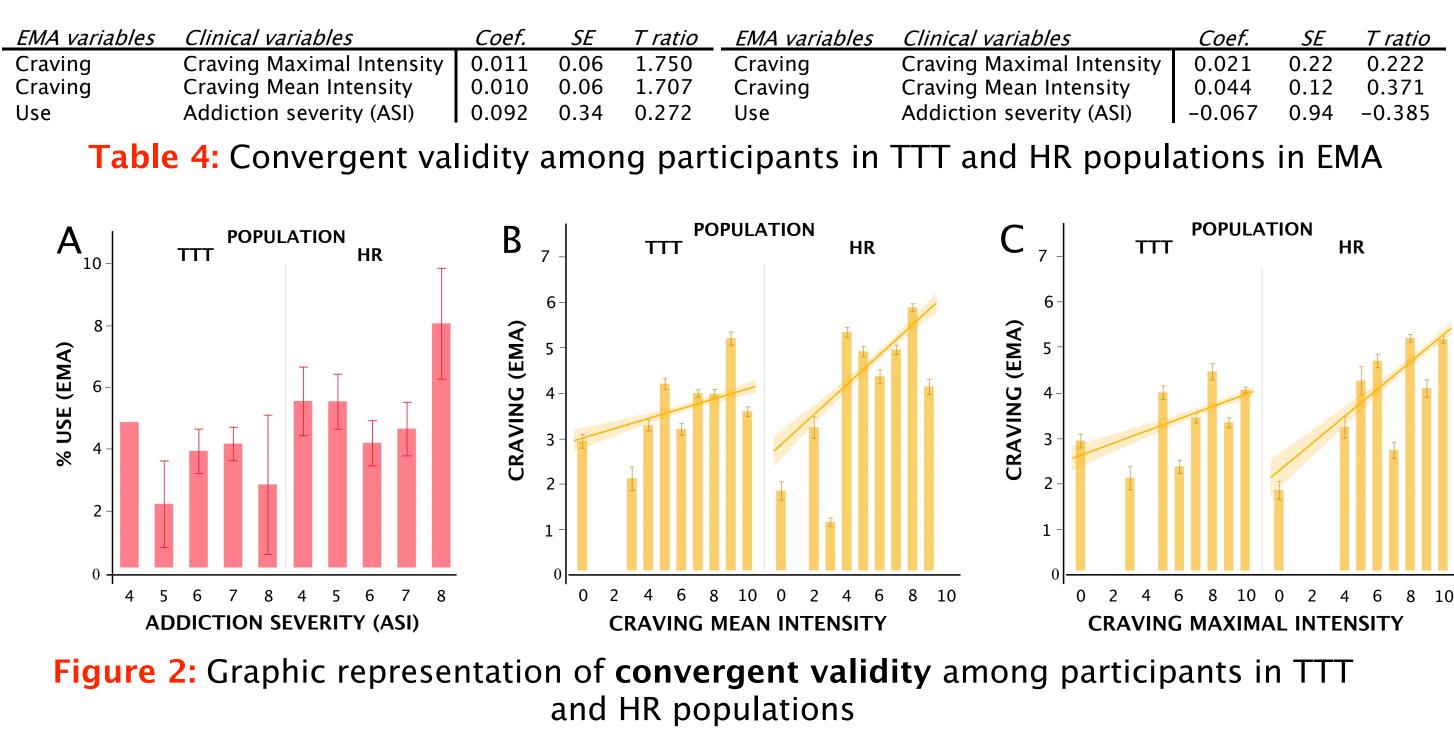
PARTNERS

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