Exploration of biomarkers of craving in daily life among tobacco, alcohol and cannabis users. Observational mixed methods pilot study.

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INTRODUCTION

Substance Use Disorder (SUD) is a chronic pathology defined as a loss of control over consumption despite its negative consequences. **Craving**, the central symptom of addiction is an irrepressible urge to use (Auriacombe et al., 2018). Craving is fluctuated in intensity and frequency over a same day (Cleveland et al., 2021) and these fluctuations can be captured by **Ecological Momentary Assessment (EMA)** (Serre et al., 2012).

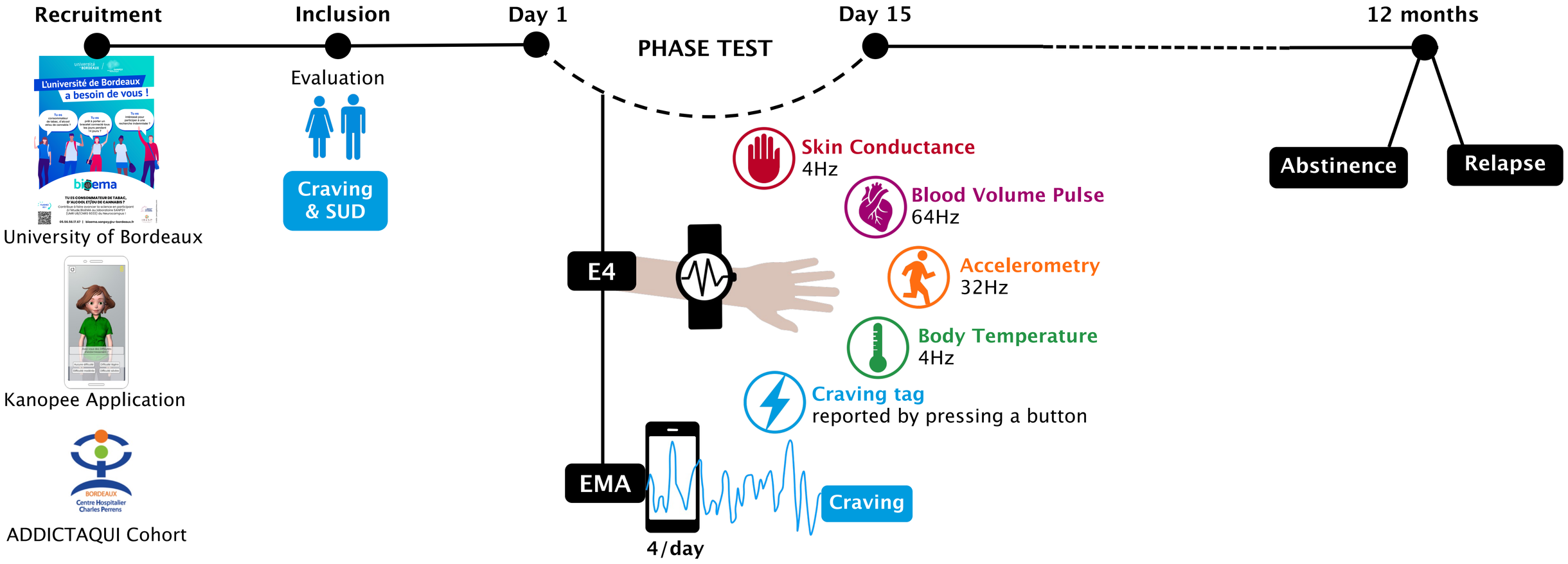
This craving may be induced by stimuli previously associated with use called "cues" that could trigger physiological responses such as increased heart rate or skin conductance (Carter & Tiffany, 1999; Sinha et al., 2003, 2009; Fatséas et al., 2011). The **link cues-craving-use** has been demonstrated with EMA (Serre et al., 2015). Some studies suggest that this physiological reactivity to cues could be the physiological expression of craving.

Craving demonstrates unique neurobiological changes (Sinha et al., 2009), and is also associated with stress-like changes in **Sympathetic Nervous System (SNS) arousal and reactivity** (Weinstein et al., 1998).

The use of sensors for long-term measurements in the natural environment allows for a broader description of the individual's psychophysiological state, with **greater reliability** than short-term laboratory measurements (Ouwerkerk et al., 2013; Scanaill et al., 2006).

The main objective will to explore whether craving variations are associated with a pattern of characteristic physiological variations in daily life

METHODS



Population:
Recruitment by KANOPEE Smartphone Application (Auriacombe et al., 2021), among students in University of Bordeaux or Care Center in Hospital Charles Perrens (ADDICTAQUI Cohort) (Bordeaux, France)
- Screened for **regular use of tobacco, alcohol or cannabis with presence of SUD** DSM-5 for this in past 12 months and **craving in 30 last days**

Evaluation:
- Addiction Severity Index (Denis et al., 2016)
- Numeric scale of craving
- Mini International Neuropsychiatric Interview including SUD DSM-5 (Sheehan et al., 1998)

Empatica E4 (Milan, Italie):

continuously measured and recorded the parameters as surrogate makers for changes in **SNS arousal**

Ecological Momentary Assessment (EMA): (Serre et al. 2012)

Real-time data collection

Natural environment

Repeated assessments

Data Analysis Strategy: machine learning algorithms

EXPECTED IMPACTS

We expect **craving episodes** to be associated with **characteristic patterns of physiological responses** including increased heart rate and skin conductance, and decreased body temperature. The wearable sensors use could allow **identification of biomarkers of craving** and present an opportunity for an **objective detection of risk of relapse** to develop innovative prevention strategies in addiction.

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PARTNERS

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