Exploring How Individuals Diagnosed with Opioid Use Disorder Define Cravings and their Views on the Utility of a Technology-Based Intervention to Manage Cravings

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Introduction/aims

Opioid use disorder (OUD) presents a public health threat as it grows to epidemic levels in the US, taking thousands of lives each year. It is a disease characterized by chronic use of opioids that leads to physical, mental, social and legal obstacles. As the derivatives and methods of consuming opioids have expanded, the efforts to combat the effects of long-term use have not kept up.

While medications such as methadone and buprenorphine have shown to be effective means of treating OUD, their use remains relatively low amongst the population. Despite the potential for medicated assisted treatment, these interventions are limited by barriers in the continuum of care such as healthcare professional education, diagnosis, entry and retention of treatment. These barriers suggest a critical need of finding a new alternative approach to treating OUD that is both personalized and widely accessible.

The aims of the larger study are to:

- **Aim 1**: Investigate pervasive and affective computing technologies as an adjunct with pharmacological therapy for OUD patients
- **Aim 2**: Develop iPAL system that connects a wearable device to monitor physiological signals, a smartphone app, a CBT module and a model for determining biofeedback interventions
- **Aim 3:** Integrate iPAL with AR/MR/VR AI-enhanced CBT delivery
  - Provide CBT coping skills for managing cravings
- **Aim 4**: Evaluation and deployment with OUD care and management
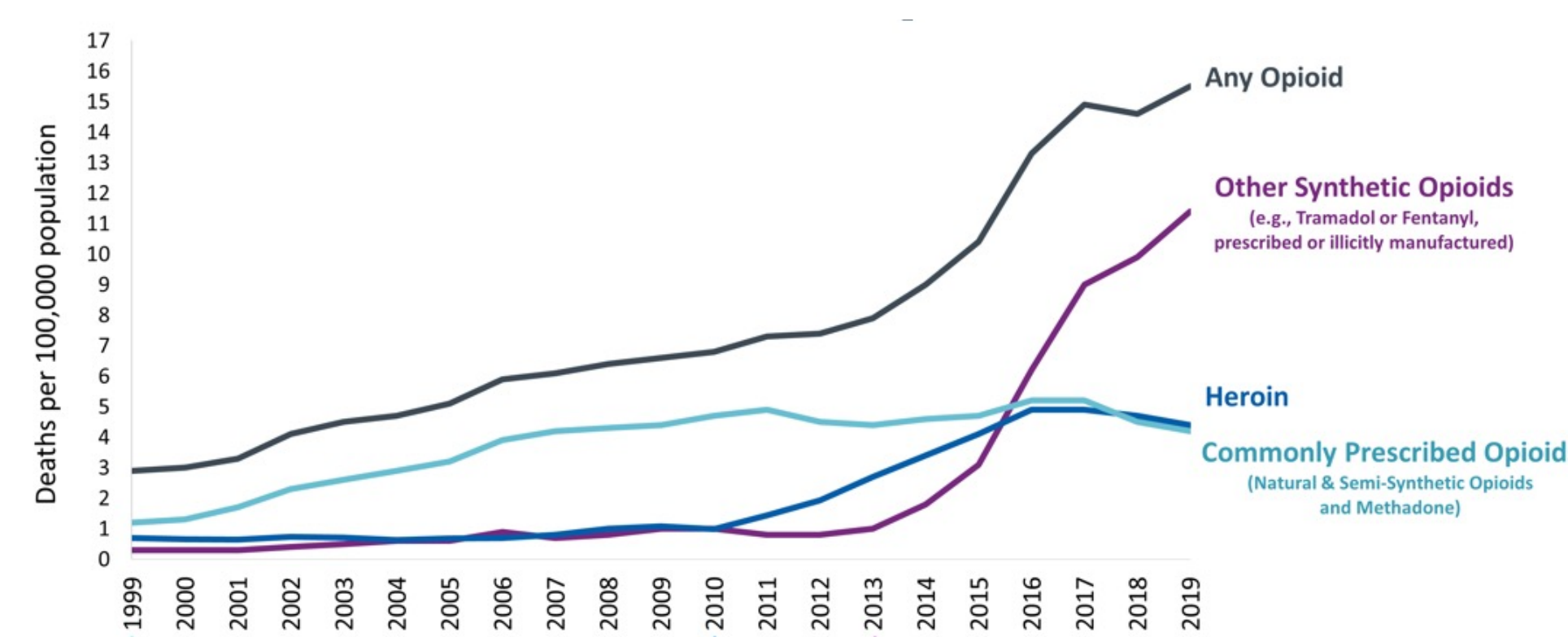

Figure 1. Three waves of the Rise in Opioid Overdose Deaths

Methodology

- In order for the study to explore the potential utility of this technology-based intervention, as reported by the participants, we conducted qualitative in-depth interviews on 9 patients receiving medication treatment for OUD in an outpatient clinic and 3 peer recovery coaches.

- This study also explored how these patients described and managed cravings. The data collected through this study will inform the utility and interest in this intervention. The study will also inform the various components of the intervention, including survey questions on the app that will help match the app user to the right intervention (e.g., CBT videos, biofeedback).
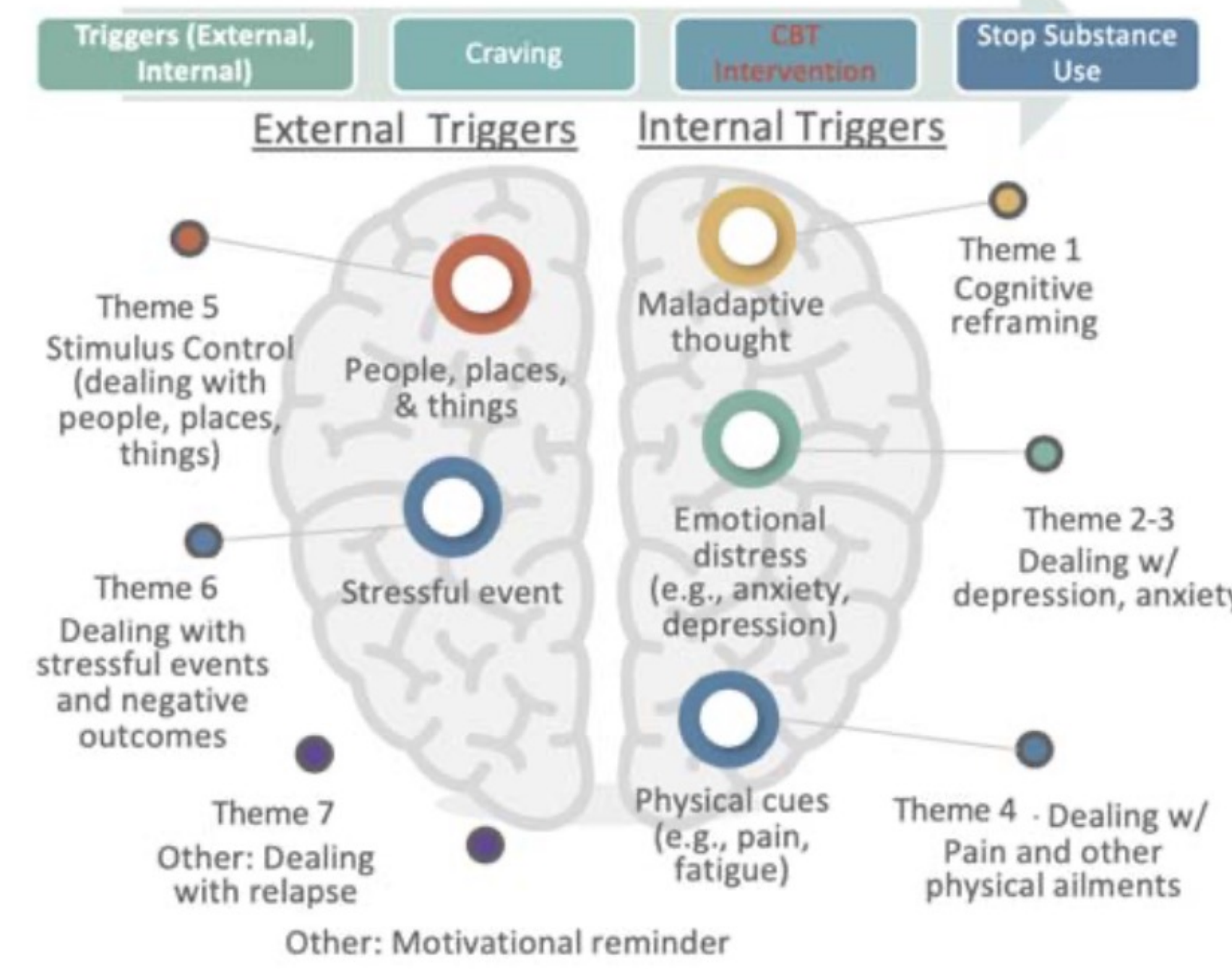

Figure 2. Proposed Cognitive Behavioral Therapy Intervention

Interview Questions

Cravings	Experience with interventions	Smartphone usage	Apparatus
1. Define what a craving means to you	5. Have you ever been in therapy? If so, what was that experience like?	10. How often do you use your smart phone in one day (how many times)?	13. How would you feel about wearing a wearable device which could be either something on your glasses or something on your body, as in a watch, that keeps track of your heart rate?
2. What tends to trigger a craving for you?	6. Have you ever tried cognitive behavioral therapy (CBT)? If so, what was that experience like?	11. On a normal day, what are some of the apps you use most often?	
3. What is the most difficult part of managing your cravings?	7. Have you ever tried breathing exercises? Is so, were they helpful?	12. Have you tried using a smartphone app specifically for your recovery?	
4. How do you manage your cravings?	8. Have you ever tried meditation? If so, was that helpful?		
	9. Do you think connecting with others who are having similar experiences would help or hinder your path to recovery?		

Preliminary Survey Responses

- While all the interviews have not been content analyzed, the preliminary results suggest that cravings are described using several experiences: (1) an uncontrollable urge to use; (2) physiological sensations (e.g., withdrawal symptoms); and (3) persistent ruminations on the drugs that are cravings (e.g., "Can't get it off my mind.")

- The participants also described the triggers that lead to cravings. These include feeling negative emotions (e.g., anxiety, depression); (2) a bad interaction with a loved one; and (3) a stressful live event (e.g., death of a friend or family).

- Furthermore, the participants reported managing cravings through distractions, cognitive strategies, and seeking social support. However, cravings management was reported to be much easier with medication-assisted treatment.

- Regarding the utility of this technology-based intervention, preliminary content analysis suggests that, while the participants are open to trying this technology, the respondents are generally not technology adapters. Their use of smartphone apps appears to be limited by the lack of access to smartphones and lack of experience with wearables.

iPAL

- Use mobile and wearable technology to collect real-time physiological data to provide a personalized, evidence-based OUD intervention using immersive technology formats

- Deliver adaptive CBT interventions based on patient's in-app cravings and trigger questionnaire, verbal responses and physiological data to deliver personal mental health support in real time

- Generate a collection of several short videos to highlight effective CBT strategies for OUD patients to address cravings
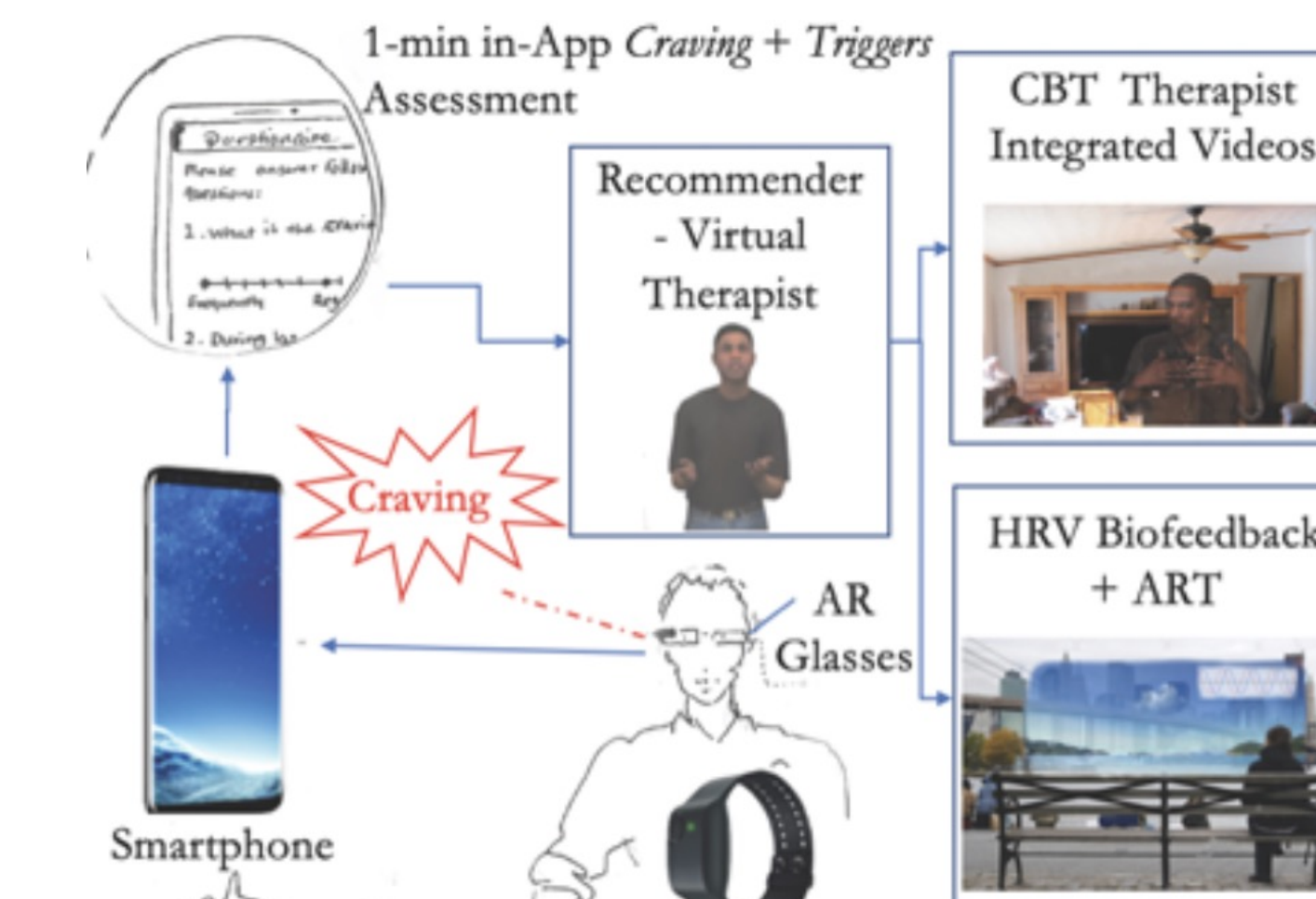

Figure 3. Overview of iPAL system functionality

References

1. Kakko, J., Alho, H., Baldacchino, A., Molina, R., Nava, F. A., & Shaya, G. (2019). Craving in Opioid Use Disorder: From Neurobiology to Clinical Practice. *Frontiers in psychiatry*, *10*, 592. https://doi.org/10.3389/fpsyt.2019.00592
2. Blanco, C., Volkow, N. (2019). Management of opioid use disorder in the USA: present status and future direction. *The Lancet, 393*, 1760-1772. https://doi.org/10.1016/S0140-6736(18)33078-2