AI-Powered Personalized Recovery Recommender System for Opioid Use Disorder

Nittany AI MVP by Tanuja Voruganti (presenter) and Muhammad Faizan Raza Presidential Public Impact Research Award Project by Nonna Sorokina, Dusan Ramljak

Introduction

- Opioid Crisis has **overrun** the **healthcare providers** and the economic resources of the USA.
- 1860's opioids were used to treat Civil War soldiers who needed critical amputations.
- Heroin surge in **2010** and Synthetic Opioid surge in 2013 have lead to an unpredictable and disastrous crisis today.

Preliminary Research and Analysis





Key Factors

Addiction Patterns Targeted Interventions



Socio-Economic and Geographic Factors play a huge role in addiction

Different groups of people have different addiction patterns

Each individual has different treatments that work for them





self-esteem inputs from user

similar users







Behavioral Parallels (*Telzer et al., 2017*) • Shared reward pathways; impulsivity/craving overlap. Measurement Equivalence (McHugh et al., 2014): • Quiz aligns with DSM-5; mirrors opioid craving assessments. Ethical Pragmatism (*Elmagarmid et al., 2014*):

• HIPAA restrictions; synthetic data validated in research.

Results

MLP Classifier Performance:

- **Training accuracy:** 99%
- **Testing accuracy:** 91%
- Minimal False Negatives

WebApp Testing Results:

Recommendation Engine:

- Similarity Match: 75-95%
- Severity Sensitivity: more effective tips generated

NittanyAl Feedback:

• Health Professional Inputs

		Reflect on how opioids are affecting your life, relationships, and goals.	
		Talk to someone you trust—admitting it out loud is a powerful step.	
		Remember: Seeking help is not weakness. It's courage.	
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- Average Session: 4-5 mins
- Seamless user input handling
- Feedback collection
- Valuable Insight and Suggestions Recieved









Collaboration and 23111 Deployment to connect with officials and deploy this application so that it can help people



*For data, references, and acknowledgements please reach out to authors at dusan.ramljak@psu.edu