Influence of Social Determinants of Health and Substance Use Characteristics on Persons Who Use Drugs Pursuit of Care for Hepatitis C Virus Infection

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Background

- Social determinants of health (SDOH) are social, behavioral, and environmental factors that contribute to health inequalities and play a disproportionately large role in health outcomes. As SDOH contribute substantially to an individual's overall physical and mental health, they can have a deleterious effect on health outcomes (Daniel, Bornstein, & Kane, 2018).
- To improve health outcomes, attempting to moderate SDOH should be prioritized (Heiman & Artiga, 2015; Taylor et al, 2016). Recently, professional societies, such as the American College of Physicians, have highlighted research gaps in the area of SDOH, particularly with regard to the inclusion of disadvantaged and underserved populations (Daniel et al., 2018; Thomas-Henkel & Schulman, 2017).

Rationale

- SDOH disproportionally affect vulnerable populations, such as persons who use drugs (PWUD) (Galea & Vlahov, 2002).
- While SDOH have been widely investigated in HIV and in sexually transmitted infections, data are limited on the influence of SDOH, substance use characteristics, and their interactions on pursuit of hepatitis C virus (HCV) care among individuals with opioid use disorder (OUD).
- Linkage to HCV care remains low in this population despite high HCV prevalence and incidence.

Aims

To investigate the influence of SDOH, substance use factors, and their interactions on HCV treatment uptake among OUD patients in a methadone treatment program.

Methods

- In this retrospective cross-sectional study, we reviewed the paper charts and electronic medical records (EMR) of all patients currently enrolled at a methadone treatment program (MTP) in the greater Western New York area.
- The community-based MTP had 481 active patients and had a turnover rate of approximately 10 patients per month at the time of data collection.
- Two researchers (NW and NB) reviewed the medical record and collaborated to ensure consistency in data extraction.
- Data were extracted from the past medical history, past or current laboratory reports, and/or the practicing physician's "impression" sections of the medical record. If any of the three areas were incomplete for a patient's EMR entry, then the patient's paper chart was reviewed.
- The two researchers conversed on a daily basis on-site at the MTP to avoid any discrepancies between medical chart language, laboratory results, and the information collected. The researchers also compared the process of data recording to ensure consistency.

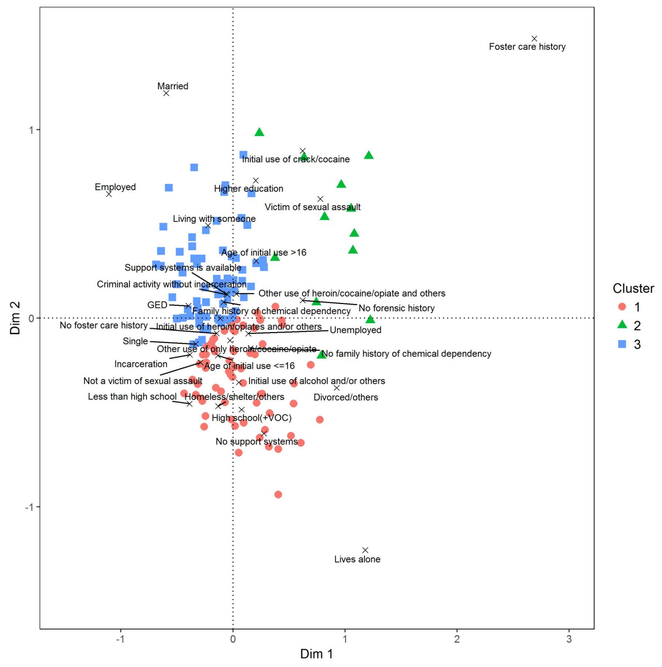
Statistical Analysis

- We performed statistical analysis using R software.
- We summarized categorical variables as counts and/or percentages, and continuous variables by their means and standard deviations, as appropriate.
- We next utilized multiple correspondence analysis (MCA) via the R package "FactoMineR" to reveal patterns of relationships of SDOH and substance use variables as performed previously (Lê, Josse, & Husson, 2008; Talal et al, 2018).
- We then implemented K-means algorithm on the first two principal dimensions of SDOH and substance use variables to group all patients into three different clusters. We used the elbow plot method to determine the number of clusters.
- We next attempted to identify factors that contribute to an individual's pursuit of HCV management. We first applied logistic regression with least absolute shrinkage and selection operator (LASSO) penalty using the R package "glmnet" (Park & Hastie, 2007) to assess the effect of the factors chosen on linkage-to-care status.

Participants

	All (n=161)			Evaluated (n=33)			Not Evaluated (n=128)		
	Size	Mean/#	SD/%	Size	Mean/#	SD/%	Size	Mean/#	SD/%
Age	161	45.2	13.4	33	48.2	13.4	128	44.27	13.3
Sex									
Female	161	70	43.5	33	8	24.2	128	62	48.4
Male		91	56.5		25	75.8		66	51.6
Race									
African American	159	25	15.7	33	8	24.2	126	17	13.5
Caucasian		96	60.4		17	51.5		79	62.7
Hispanic/Native American		38	23.9		8	24.2		30	23.8
Primary Language									
English	157	133	84.7	31	27	87.1	126	106	84.1
Spanish		24	15.3		4	12.9		20	15.9

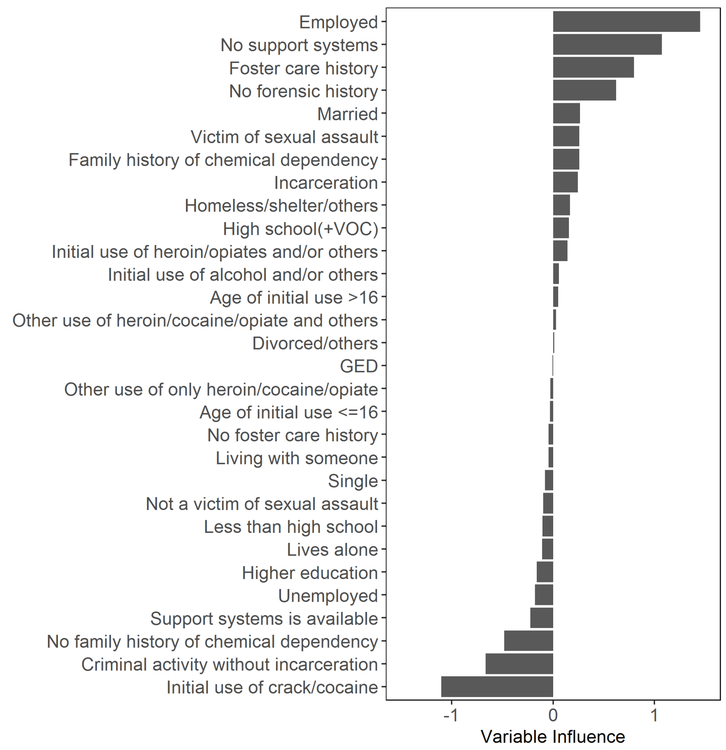
Participant identification by cluster of factors associated with linkage-to-care for HCV



Characteristics of patients in different clusters

Category	Variable	Cluster 1 (n=68)	Cluster 2 (n=12)	Cluster 3 (n=75)
Social determinants of health	Living situation	Homeless/shelter/ others or lives alone		Living with someone
	Marital status	Divorced/others		Married or single
	Employment status	Unemployed		Employed
	Highest educational level	Less than high school or high school (+VOC)		GED or higher education
	Forensic history		No	Criminal activity without incarceration or incarceration
	Support systems	No		Yes
	Victim of sexual assault	No	Yes	
	Foster care history	No	Yes	
Substance use	Age of initial use	≤ 16		> 16
	Family history of chemical dependency	No		Yes
	Substance of initial use	Alcohol and/or others	Crack/cocaine	Heroin/opiates and/or others
	Other illicit substance	Only heroin/cocaine/opiate		Heroin/cocaine/opiate and others

Factors affecting linkage-to-care status



Discussion

- We sought to understand the influence of social determinants, substance use characteristics, and their interactions on whether a PWUD would pursue an HCV evaluation.
- Those most likely to pursue an HCV evaluation were employed with a history of foster care without available social support systems. Conversely, those least likely to link to HCV care reported that their initial illicit substance used was crack or cocaine, that they had been involved in criminal activity without incarceration, and that they had no family history of chemical dependency.
- Changing HCV demographics, largely as a result of the opioid epidemic, underscores the importance of understanding how social and substance use factors positively or negatively influence HCV linkage to care.

University at Buffalo The State University of New York

Research reported in this work was partially supported by NIH training grant T35 AI089693, the Troup Fund of Kaleida Health Foundation, and through a Patient-Centered Outcomes Research Institute (PCORI) Award (IHS-1507-31640). The statements in this work are solely the responsibility of the authors and do not necessarily represent the views of PCORI, its Board of Governors or Methodology Committee.