Poly-substance use, treatment completion, and contact with the justice system: a multistate analysis of treatments for substance use disorders between 2010-2019 in Chile

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Background

Substance use disorders (SUD) often co-occur with criminality, including violence, arrests, and incarceration[1;2;3]. People with polysubstance use (PSU) are considered a high-risk population, as they are associated with mortality, relapse, and contact with the criminal justice system (CJS)[4;5;6]. Although completing SUD treatment is linked with better outcomes, including preventing contact with CJS, the role of treatment completion in the link between PSU and contact with CJS is unclear[7;8]. Studies have found mixed evidence regarding the association between PSU and treatment completion rates[9;10;11;12]. Thus, it is crucial to determine the role of treatment completion in order to improve outcomes in people with PSU. However, analyzing the role of treatment outcomes in people with PSU is challenging, as there is limited research on this population in Latin America, and high-risk populations have often been overlooked[13;14;15]. The study contributes to a growing literature on the importance of addressing longitudinal dynamics in specific profiles of SUD patients. Studying the link between PSU, treatment completion, and criminality is crucial for evidence-based strategies to address SUD-related issues. Effective interventions and tailored approaches for people with PSU can mitigate societal and individual harms stemming from SUDs and criminal behavior.

Objectives: To estimate the mediating effects of completing SUD treatment on the relationship between PSU at admission and contact with CJS among adult patients admitted to SUD treatment programs in Chile during 2010-2019. **Specific**: (1) To describe the prevalence of PSU, treatment completion, and contact with CJS in the sample, (2) to compare the risk of contact with CJS between people with poly and single-substance use, and (3) to estimate the proportion of the effect of PSU and treatment outcome on the contact with CJS.

Methods

Design: a retrospective cohort based on the administrative data's record linkage. **Data**: Chilean SUTs programs and Prosecutor's Office through a deterministic linkage process. **Ethics**: We are in the process of an amendment to an existing ethical approval from a study using the same data.

Variables

Exposure: baseline PSU (using more than one main substance among alcohol and illicit drugs at admission to SUD treatment, whether sequential or concurrent); **Mediator**: SUD treatment outcome (complete vs. dropout or spelled by misconduct); **Outcome**: contact with CJS (committing an offense that led to a condemnatory sentence).

Analytical Plan

The study controlled for various confounding variables listed in Figure 1. Patients were weighted by the inverse probability of PSU (IPWs) based on several predictors. Weights were truncated at the 1st and 99th percentiles[16].

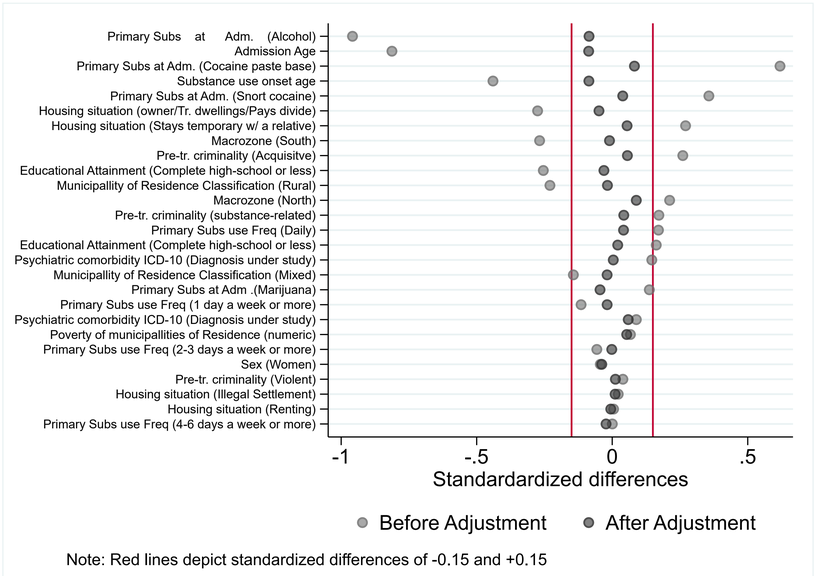

Figure 1: Covariate balance

We used the illness-death multistate structure to estimate transitions from admission to treatment outcome, treatment outcome to contact with CJS, and admission to contact with CJS (without completing treatment) for patients with PSU and no PSU.

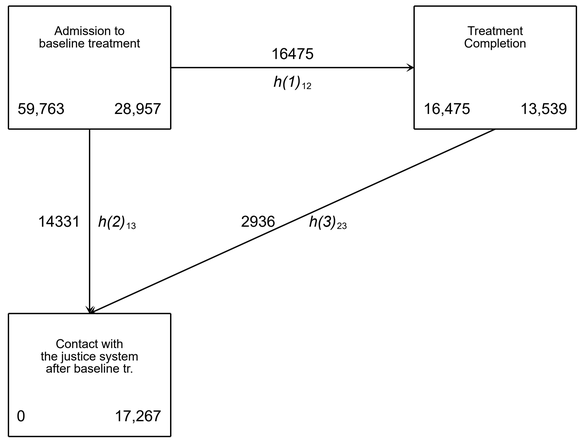

Figure 2: Multistate scheme

We calculated the Aalen-Johansen estimator for transition probabilities at 6 months, 1 & 3 years using `multistate` in Stata [17]. Secondary analyses will focus on mediating effects of treatment outcome and using a time-to-first-event approach[18;19;20]. Markdowns & codes are available on https://fondecytacc.github.io/nDP/.

Preliminary Results

- Before IPWs, patients with PSU (56.43 95%CI: 55.33,57.52) had lower rates (x1,000 person-years) of treatment completion vs. patients with no PSU (107.47 95%CI: 104.41,110.53) 0.53 95%CI: 0.51,0.54. However, patients with PSU (90.74 95%CI: 89.36,92.12) had greater rates of contact with the justice system vs. patients with no PSU (54.12 95%CI: 52.33,55.92) IRR= 1.68 95%CI: 1.62,1.74.
- After IPWs, patients with PSU (67.41 95%CI: 65.87,68.96) still had lower rates of treatment completion vs. patients with no PSU (87.04 95%CI: 83.46,90.62) 0.77 95%CI: 0.74,0.81, and patients with PSU (80.26 95%CI: 78.78,81.74) also had greater rates of contact with the justice system vs. patients with no PSU (72.25 95%CI: 69.01,75.48) IRR= 1.11 95%CI: 1.06,1.17.

Table 1: Transition probabilities in states

Transition	Time	PSU	No PSU
From admission to contact with CJS	6_mths	2.2 (2.1,2.3)	1.8 (1.7,1.9)
From admission to contact with CJS	1_yr	7.9 (7.6,8.1)	6.6 (6.4,6.8)
From admission to contact with CJS	3_yrs	24.4 (24.0,24.7)	20.7 (20.3,21.1)
From admission to contact with CJS	5_yrs	33.3 (32.8,33.7)	29.5 (29.0,30.0)
From admission to tr.completion	6_mths	3.1 (2.9,3.2)	4.0 (3.9,4.2)
From admission to tr.completion	1_yr	14.6 (14.3,14.8)	17.6 (17.3,18.0)
From admission to tr.completion	3_yrs	23.6 (23.2,23.9)	27.0 (26.6,27.4)
From admission to tr.completion	5_yrs	21.4 (21.0,21.8)	24.9 (24.4,25.3)
From tr.completion to contact with CJS	6_mths	3.0 (2.0,4.0)	2.4 (1.3,3.4)
From tr.completion to contact with CJS	1_yr	8.7 (7.5,9.8)	5.9 (4.8,7.0)
From tr.completion to contact with CJS	3_yrs	21.1 (20.0,22.3)	16.2 (15.1,17.3)
From tr.completion to contact with CJS	5_yrs	28.6 (27.4,29.8)	23.0 (21.8,24.2)

People with PSU have higher probabilities of contact with the CJS, both after admission and after treatment completion, vs. without PSU. Also, people with PSU are less likely to complete treatment vs. no PSU. Treatment completers had lower probabilities of contact with the CJS vs. non-completers after 3 years since admission.

Discussion

Treatment completion can reduce the risk of criminal justice involvement, which is evident at 3-year mark when most users have finished treatment. Further analysis is needed. People with PSU may need enhanced treatment to complete treatments and avoid contact with the CJS.

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