Post-discharge treatment engagement among patients with an opioid-use disorder ☆

Sarah Naeger, Ph.D., M.P.H. [a,*], Ryan Mutter, Ph.D. [a], Mir M. Ali, Ph.D. [a], Tami Mark, Ph.D., MBA [b], Lauren Hughey, M.P.H. [b]

[a] Substance Abuse and Mental Health Services Administration, 5600 Fishers Lane, Rockville, MD 20857
[b] Truven Health Analytics, 7700 Old Georgetown Road, Bethesda, MD 20814

ARTICLE INFO

ABSTRACT

Introduction: Opioid misuse is a growing public health problem, and estimates show a 150% increase in opioid-related hospital stays over the last two decades. This study examined factors associated with substance use treatment engagement following a hospitalization for opioid use disorder or overdose.

Methods: This study analyzed the Truven Health Analytics MarketScan® Commercial Claims and Encounters (CCAE) database for 2010 through 2014 to study post-hospitalization substance use disorder (SUD) treatment of individuals aged 18–64 who had an inpatient admission for an opioid-use disorder or opioid overdose. Engagement in post-discharge SUD treatment was defined as having at least two unique outpatient visits within 30 days of a hospitalization. Generalized estimating equations (GEEs) with a binomial link were used to determine the factors associated with SUD treatment engagement.

Results: Only 17% of patients engaged in SUD treatment within 30 days of hospital discharge. A behavioral health outpatient visit prior to the SUD admission increased the odds of engaging in SUD treatment by 1.34 (CI: 1.25–1.45), an antidepressant prescription drug fill prior to the SUD admission increased the odds by 1.14 (CI: 1.07–1.21), a benzodiazepine fill prior to the SUD admission increased the odds by 1.14 (CI: 1.07–1.21), a principal diagnosis for an SUD at index admission increased the odds by 2.13 (CI: 1.97–2.30), an alcohol-related disorder diagnosis at index admission increased the odds by 3.13 (CI: 2.87–3.42), and an additional SUD diagnosis at the index admission increased the odds by 2.72 (CI: 2.48–2.98).

Conclusions: We found low rates of SUD treatment engagement following hospitalizations for opioid use disorders and overdoses. Patients with prior engagements with behavioral health providers were more likely to engage in follow-up care; therefore, providers may need to focus additional efforts on patients admitted to the hospital with opioid-use disorders who do not have an existing provider relationship.

Published by Elsevier Inc.

1. Introduction

Misuse of and dependence on opioids are critical public health problems (Macrae, Hyde, & Slavitt, 2015). National estimates from the 2014 National Survey on Drug Use and Health (NSDUH) show that approximately 1.9 million people in the United States had a substance use disorder (SUD) related to prescription opioids and 586,000 people had an SUD related to heroin (Center for Behavioral Health Statistics and Quality, 2015). About 17,000 people die each year from prescription opioid overdoses (American Society for Addiction Medicine, 2015). The opioid epidemic has led to a significant increase in hospitalizations for

poisoning by prescription opioids, sedatives, and tranquilizers (Coben et al., 2010). Opioid-related hospitalizations increased 150% between 1993 and 2012 (Owens, Barrett, Weiss, Washington, & Kronick, 2014). In 2012, the hospitalization rate for opioid misuse was 295.6 stays per 100,000 (Owens et al., 2014).

Research shows that outpatient treatment following a hospitalization is associated with better outcomes, including reduced use of drugs and alcohol, fewer substance use problems, and lower arrest rates (e.g., Gilbert, 1988; McCarty et al., 2014; McKay, 2009; Peterson, Swindle, Phibbs, Recine, & Moos, 1994; Reif et al., 2014), and patients with an SUD who do not receive follow-up services have a much higher risk of being readmitted (Blodgett, Maisel, Fuh, Wilbourne, & Finney, 2014; McCarty et al., 2014; Reif et al., 2014). Outpatient treatment engagement has been shown to be associated with a lower two-year mortality rate among veterans (Harris et al., 2015).

Research has found that among patients who are discharged from an inpatient substance abuse detoxification stay, only half (49.4%) received follow-up mental health or substance abuse treatment within 30 days of

discharge (Mark, Dilonardo, Chalk, & Coffey, 2003). Smith and Mark (2014) found that in the commercially insured population, the annual percentage rate of individuals who received any outpatient treatment for a mental health disorder or SUD within 30 days of a related inpatient stay has increased steadily. In 2012, 66.1% of commercially insured patients with an inpatient stay related to substance abuse had at least one outpatient visit within 30 days of discharge (Smith & Mark, 2014). Nevertheless, a substantial percentage of patients are not receiving follow-up outpatient care even though multiple clinical guidelines recommend that patients with an SUD receive continuing care after an intensive inpatient treatment episode (American Psychiatric Association, 1995; Blodgett et al., 2014).

Factors associated with receiving follow-up care following an SUD detoxification hospitalization include being female, being in a behavioral health carve-out plan, and having lower cost-sharing requirements for an outpatient substance abuse visit (Mark et al., 2003). Harris, McKellar, Moos, Schaefer, and Cronkite (2006) examined the factors associated with months of engagement in continuing care following discharge from a residential SUD treatment program. They found that being African American, having more SUD and psychiatric symptoms, having more resources for recovery, and perceiving the treatment staff as being supportive were associated with longer engagement in continuing care. The authors also found that prior engagement with a behavioral health provider before the intensive treatment episode had a positive association with continuing care engagement (Harris et al., 2006). In their study of veterans, Timko, Gupta, Schultz, and Harris (2016) found that being black, female, younger, homeless, having fewer comorbidities, and having had prior addiction treatment were characteristics associated with follow up and transition to addiction treatment after detoxification. Building on prior research, the goal of this study was to explicitly study factors that were associated with postdischarge treatment engagement for patients hospitalized for an opioid use disorder or overdose.

2. Methods

2.1. Study sample

The study design was a retrospective analysis of the Truven Health Analytics MarketScan Commercial Claims and Encounters (CCAE) database for the years 2010 through 2014. This de-identified database includes insurance claims from approximately 50 million employees and dependents covered by large, self-insured employers and regional health plans annually. The MarketScan database captures all billed services, including prescription drugs, outpatient services, and inpatient services. Services for mental health disorders and SUDs that are carved out to separate management companies also are captured in the database. The MarketScan CCAE patient identifiers are encrypted, and the data are compliant with the Health Insurance Portability and Accountability Act of 1996 (HIPAA). Because this was a retrospective study using encrypted data, institutional review board (IRB) approval was not necessary for this study.

This study analyzed individuals aged 18–64 who had an inpatient admission for opioid use disorder or overdose between January 1, 2010 and September 30, 2014. We included only those patients who had at least 90 days of continuous enrollment before the inpatient admission and 30 days of continuous enrollment after being discharged to ensure that there was sufficient time before and after the inpatient admission to identify health care utilization patterns. If an individual had more than one inpatient admission that met the inclusion criteria in the four year study period, we selected the first admission as the index admission.

We used a broad definition to identify inpatient admissions for opioid use disorder or overdose. We included hospitalizations with one or more International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) diagnosis codes (Centers for Disease Control and Prevention, 2014) representing opioid abuse, dependence, poisoning, or adverse effects (304.0×, 304.7×, 305.5×, 965.0×, E850.0–E850.2, E935.0, E935.1, E935.2) in any diagnosis field (i.e., not just the principal diagnosis). We excluded hospitalizations with diagnoses of suicide and self-inflicted poisoning (E950.0–E950.5) or assault by poisoning (E962.0).

2.2. Dependent and independent measures

Currently, there is no endorsed, 30-day follow-up-after-discharge measure for SUDs specific to opioid use disorders. However, the National Committee for Quality Assurance (NCQA) Healthcare Effectiveness Data and Information Set (HEDIS) tracks the rate of outpatient follow up within 7 or 30 days of an inpatient psychiatric discharge. The most comparable HEDIS measure for SUDs is *engagement*, which requires two outpatient SUD visits within 30 days of initiation of treatment (NCQA, 2015). We modeled our study outcome after the HEDIS engagement measure: our dependent variable was a binary variable that indicated whether the patient did or did not engage in SUD outpatient treatment after being discharged from the hospital as measured by having at least two unique outpatient visits within 30 days of discharge. To qualify as an SUD outpatient treatment visit, the engagement measures' specifications required a combination of current procedural terminology (CPT) psychiatric procedure codes and SUD ICD-9-CM diagnosis codes.

We identified the health care utilization services that patients received in the 90-day window before the index admission. These services included inpatient stays with a principal diagnosis of a physical health condition or a behavioral health condition (excluding opioid use disorders or overdoses); emergency department (ED) visits with a first-listed diagnosis for a physical health condition or a behavioral health condition; outpatient visits for a physical health condition or a behavioral health condition based on the first diagnosis on the claim; and an antidepressant, antipsychotic, benzodiazepine, or any opioid prescription fill prior to hospitalization.

Additional covariates from the index admission included the patient's age, secondary psychiatric or SUD diagnoses, secondary comorbid physical health conditions, and length of stay. In order to identify which secondary physical health conditions to control for in our model we used the MarketScan Treatment Pathways tool, which is a Web-based interface for the MarketScan data, to identify our patient sample. After defining the cohort in Treatment Pathways, we generated descriptive summaries of the most common physical health diagnoses on the index admission. Once identified, we used the multilevel Clinical Classifications Software (CCS) for ICD-9-CM from the Agency for Healthcare Research and Quality's (AHRQ) Healthcare Cost and Utilization Project (HCUP) to categorize the most frequent physical health comorbidities coded on the index admissions. We generated a binary variable indicating which patients had a principal diagnosis of an SUD on their index admission. We also included binary indicators that identified patients with a diagnosis code for an opioid overdose, or who were admitted from an ED, those who were discharged against medical advice, and those who received detoxification or rehabilitation services during their index admission.

2.3. Statistical approach

We used descriptive statistics to describe patient demographics, mental health diagnosis at index admission, and the types of services these patients received during the 90-day period prior to hospitalization. We used generalized estimating equations (GEEs) with a binomial link to measure the association between engagement in postdischarge SUD treatment and the independent variables (Ziegler, 2011). A binomial GEE model was necessary to control for patient clustering within health plans. The final adjusted model also included fixed effects for the year of the index hospitalization to account for changes in the rate of hospitalizations for opioid use disorder over time (Owens et al.,