Preventable hospitalizations among adult Medicaid beneficiaries with concurrent substance use disorders☆

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ABSTRACT

Objective. We aim to examine the relationships between substance use disorders and preventable hospitalizations for Ambulatory Care Sensitive Conditions among adult Medicaid beneficiaries.

Methods. Cross-sectional analysis using de-identified Medicaid claims data in 2012 from 177,568 beneficiaries in Missouri was conducted. Logistic regression models were estimated for the associations of substance use disorder status with Ambulatory Care Sensitive Conditions, demographics, chronic physical and mental illnesses. Zero-inflated negative binomial regressions assessed substance use disorders, hospitalization for Ambulatory Care Sensitive Conditions, and length of hospital stay for Ambulatory Care Sensitive Conditions adjusting for co-morbid physical illnesses, mental illnesses and demographics.

Results. Over 12% of the sample had been diagnosed for substance use disorder. Beneficiaries with substance use disorder were more likely than Nonsubstance use disorder beneficiaries to have admissions for chronic conditions including short/long-term complications of diabetes, uncontrolled diabetes, hypertension, chronic obstructive pulmonary disease/asthma, but not for acute conditions. While substance use disorder beneficiaries were more likely than Nonsubstance use disorder beneficiaries to be hospitalized for any Ambulatory Care Sensitive Conditions; there were no statistical differences between the two groups in terms of length of hospital stays.

Conclusions. Substance use disorder is statistically associated with hospitalizations for most Ambulatory Care Sensitive Conditions but not with length of hospital stay for Ambulatory Care Sensitive Conditions, after adjusting for covariates. The significant associations between substance use disorder and Ambulatory Care Sensitive Condition admissions suggest unmet primary health care needs for substance use disorder beneficiaries and a need for integrated primary/behavioral healthcare.

Introduction

Drug users often face multiple, concurrent physical and mental health problems (Morgenstern et al., 2008; Lynskey and Strang, 2013; Degenhardt and Hall, 2012; Degenhardt et al., 2013). Although drug users are more in need of health care services because of poor general health compared with the general population, they are less likely to receive the same quality of health care as their non-drug use counterparts (Deehan et al., 1998a,b,c; Ahern et al., 2007). Several contributory factors have been identified for this disparity in health care services between drug-users and non-users, including poor treatment compliance (Brener et al., 2010; Cohen et al., 2004), inability to access desired assistance (Druss and von Esenwein, 2006; Santos et al., 2013; McCoy et al., 2001), stigmatization of drug users by medical personnel at health care facilities (Neale et al., 2007, 2008; Henderson et al., 2008), and disadvantaged socioeconomic status (Rice, 1991; McBride et al., 2005). Consequently, drug users may not have adequate access to proper care when they get sick. Even when proper care is accessible, they may still be reluctant to seek professional treatments because of negative experiences from past services. The delay of proper and timely treatment could therefore lead to deterioration of an existing illness which in turn may result in hospital admissions.

Research indicated that hospitalizations for certain health conditions such as complications of diabetes, hypertension, chronic obstructive pulmonary disease (COPD), asthma, and some other problems are potentially preventable if proper and timely care is provided (Ansari et al., 2006; Agency for Healthcare Research and Quality, 2014; Bindman et al., 1995). Because admissions for these health problems,

also termed as Ambulatory Care Sensitive Conditions (ACSCs), are considered preventable, rates of ACSC hospitalization are frequently used as the indicator of the quality of outpatient services and the measure of access to primary care (Bindman et al., 1995; Basu et al., 2014). Apparently, both patients and the health care system may greatly benefit from reducing hospitalizations for ACSCs. However, there is a gap in the research literature when it comes to understanding the relationships between substance use disorders (SUDs) and admission for ACSCs.

While many studies have shown that SUD is associated with preventable conditions/ACSCs (Sumino et al., 2014; Sumino and Cabana, 2013; Caponnetto et al., 2013; Clark et al., 2009; Gore et al., 2010; Maruyama et al., 2013; Coffey et al., 2012), the relationships between ACSC admissions and substance use/dependency are relatively under-explored. In a systematic qualitative review of studies on preventable hospitalization in chronic diseases, Muenchberger and Kendall found that over one-third of the reviewed studies focused on health status, socioeconomic status, or general demographics, whereas substance abuse/dependency was examined by less than 5% (Muenchberger and Kendall, 2010). Several recent studies have indirectly explored these issues; however, they focused mainly on other specific populations, such as patients with co-occurring mood disorders (Daratha et al., 2012), veterans (Gao et al., 2014; Yoon et al., 2012), or patients with a specific medical diagnosis such as diabetes (Leung et al., 2011; Druss et al., 2012), where substance users were treated as a sub-group in these studies.

In the US, it is estimated that 13% of adult Medicaid beneficiaries have been diagnosed for substance use disorders within a 12-month time period (Busch et al., 2013), totaling over three million people in 2011 (Kaiser Family Foundation, 2014; United State Census Bureau, 2014; Centers for Medicare and Medicaid Services, 2011). If Medicaid expansion in the United States has been implemented in all states in 2014, an addition of over 2.5 million uninsured adults with a current SUD might become Medicaid eligible (Substance Abuse and Mental Health Services Administration, 2013). With the increasing number of SUD patients enrolled in the health care system, the lack of information about drug use disorders and hospitalization for ACSCs may hamper the development of cost effective programs for this population. To understand better the SUD–ACSC relationships among adult Medicaid beneficiaries, the present study examined hospitalizations for ACSCs among adult Medicaid beneficiaries in Missouri who had a concurrent SUD in a 12-month time period. We believe that this is the first exploratory study with a primary focus on drug use disorders and preventable hospitalization in a statewide low-income population.

Methods

Data source

This study was a cross-sectional analysis utilizing a de-identified Medicaid data extract provided by the Missouri Medicaid Agency (MoHealthNet). The dataset consisted of de-identified claims information, including duration of Medicaid eligibility, diagnoses, dates of services, inpatient and discharge information, residential location indicators, as well as general demographics in 2012. Study protocols were approved by the Institutional Review Board at the University of Missouri — St. Louis and by MoHealthNet.

Study sample

In 2012, nearly a million (n = 987,163) people were enrolled in the Missouri Medicaid program. We excluded those who were younger than 18 years old (n = 540,068) and/or having a total of more than 30 days without Medicaid coverage (n = 132,570). Due to the potentially incomplete claims data for those who were also enrolled in Medicare, an additional 136,957 people who were both Medicaid and Medicare dually eligible (duals) were excluded. After further excluding cases with missing data, there were 177,568 adult Medicaid beneficiaries in the final sample.

Measures

In the data extract, each claim was associated with up to five ICD-9-CM diagnoses. A positive diagnosis (yes/no) for a target disorder was identified if any of the five ICD-9-CM codes in the claims data met the code set for the target disorders during the reporting period. To determine SUDs, ICD-9-CM codes for dependence on or abuse of alcohol, opiates, sedatives, cocaine, cannabis, amphetamine, hallucinogens, and other substances were examined (2910–2929, 30300–3059). Beneficiaries were identified as 'SUD' cases if they were diagnosed for any of these SUDs in the 12-month time period and otherwise labeled as 'NonSUD'. For ACSC admissions, a list of thirteen Prevention Quality Indicators (PQIs) developed by the Agency for Healthcare Research and Quality (AHRQ) were used to identify ACSC admissions, which include diabetes, COPD/asthma, hypertension, heart failure, angina, appendicitis, dehydration, bacterial pneumonia, and urinary tract infection (URI), (AHRQ, 2014). Nine of them were grouped together to form the chronic conditions (see Table 3). The principal diagnosis for an episode of hospitalization was determined by the first discharge diagnosis in the claims data. Additionally, we examined the total number of inpatient days related to any ACSCs and chronic ACSCs.

Statistical analysis

Bivariate associations between SUD status and categorical demographic variables; SUD and illnesses (ACSCs with physical and mental illnesses) were examined using odds ratios and chi-square tests. Crude odds ratios (ORs), adjusted odds ratios (aORs) and 95% confidence interval (95% CI) for the associations between admissions for individual ACSCs and SUD were estimated using logistic regression models. Furthermore, zero-inflated negative binomial regression (ZINB) was used to estimate the relationship of SUD, with the length of hospital stay regarding ACSCs and chronic ACSCs. Zero-inflated negative binomial regression is suitable for modeling data with overdispersed count variables and excessive structured zeros commonly observed in insurance, biomedical, and health science studies (Ismail and Zamani, 2013; Phang and Loh, 2013). For multivariate analyses, co-morbid chronic physical illnesses, mental illnesses, and socio-demographic variables such as age group, gender, race/ethnicity, and residential location were used for statistical adjustments. Specific chronic physical illnesses included heart failure, hypertension, diabetes, COPD/asthma, and an overall comorbidity measure defined as the total number of physical illnesses (n = 26) in the claims data (Elixhauser et al., 1998). Mental illnesses included schizophrenia (295xx); bipolar-disorder (2960); other mental illnesses such as major depression, episodic mood disorders, anxiety, dissociative and somatoform disorders, acute reaction to stress, and other nonpsychotic mental illnesses (2962x, 2963x, 2969–2988, 300xx, 301–3026, 3071, 30751–30753, 3083–3149); and pervasive developmental disorders/intellectual disabilities (29900–2998, 317xx–319xx). Codes for mental illnesses were based on the code sets used by the Missouri Department of Mental Health to identify clients for the statewide Health Care Home Initiative. Regression analyses on ACSC admissions and length of hospitalizations were conducted among cases with the corresponding diagnoses. For example, admissions for uncontrolled diabetes were analyzed for those who have diabetes. We used a 4-category variable (metropolitan, micropolitan, small town, and rural) based on beneficiaries' residential zip codes to define residential location (Rural Health Research Center, 2014). All statistical tests were two-sided, with alpha = 0.05. SAS statistical software, version 9.3 (SAS Institute Inc., Cary, NC) was used for all statistical analyses and the GENMOD procedure for the two-part modeling.