

Regular article

Hospitalizations and hospital charges for co-occurring substance use and mental disorders

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Received 6 May 2010; received in revised form 17 December 2010; accepted 23 December 2010

Abstract

Most published studies have examined co-occurring disorders among mental health patients. Our objective was to compare the length of stay and hospital charges between hospitalized patients with alcohol- or substance-related disorders with and without co-occurring disorders. We analyzed nationally representative hospital discharge data (Nationwide Inpatient Sample, 2003–2007) and examined factors associated with length of stay and hospital charges. Forty-four percent of patients who were hospitalized with alcohol- or substance-related disorders were diagnosed with co-occurring mental disorders, representing 979,421 such disorders nationwide between 2003 and 2007. Females, those of White race, those who paid with insurance, and those who stayed in large, rural, nonteaching, and Midwest region hospitals had a high prevalence of co-occurring disorders. Co-occurring disorders were associated with longer hospital stays, but there were mixed results with hospital charges per discharge. An increase in co-occurring disorders among hospitalized patients with substance-related disorder may be due to the improvement in diagnosis and clinical attention. Published by Elsevier Inc.

Keywords: Co-occurring; Substance-related disorder; Hospital charges; Length of stay

1. Introduction

Co-occurring disorder (COD), a term interchangeably used with dual diagnosis or comorbidity, refers to individuals who “have one or more substance-related disorder as well as one or more mental disorder” (*Co-occurring Center for Excellence, 2007*). Early statistics on COD from the National Comorbidity Survey and the Baltimore Epidemiologic Catchment Area survey found that in the 1990s, approximately half million noninstitutionalized adults in the United States had serious mental illness, and 14.7% of them had a co-occurring substance use disorder. Of the adults who had a substance use disorder, approximately 17.2% had

serious mental illness (*Kessler et al., 1996*). By 2007, the reported number of U.S. adults who had co-occurring mental and drug disorders jumped to 5.4 million (*Office of Applied Studies, 2008*).

When counting CODs, the prevalence rate differs depending on whether the base population is individuals with a mental disorder or a substance disorder. A recent National Survey on Drug Use and Health (NSDUH) estimated that 22.2 million persons in the United States, or 9.0% of the population 12 years or older, met the criteria for substance dependence or abuse, and 24.9 million U.S. adults 18 years or older, or 11.3% of all adults, had severe psychological distress (*Office of Applied Studies, 2009*). Studies in the late 1990s found that of patients with mental disorder, 20% to 50% had co-occurring substance disorders, whereas among patients with substance disorder, 50% to 75% had co-occurring mental disorders (*Kessler et al., 1996; Sacks, Sacks, De Leon, Bernhardt, & Staines, 1997*), suggesting that the co-occurring rate is likely to be higher

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among individuals who had substance disorders than those who had mental disorders.

Findings from previous research have suggested that patients with CODs, compared with those with sole mental or substance use disorders, are more likely to have an elevated risk of other health conditions and problems, have more negative health outcomes, have longer hospital stays, are in need of hospitalization, and/or are hospitalized in urgency (Curran et al., 2003; King, Kidorf, Stoller, & Brooner, 2000; Lambert, LePage, & Schmitt, 2003; Martín-Santos et al., 2006; Rosenberg et al., 2001). Clinical evidence also indicates that the diagnosis and therapeutic process for CODs tend to be more complicated and often involve different criteria, processes, and treatment procedures than that for sole diagnosis (Curran et al., 2003; Martín-Santos et al., 2006).

In recent years, increased attention has been given to CODs in the fields of medicine and public health. Although national studies, such as the NSDUH, have reported COD prevalence annually, these reports often used mental health cases as a base population when looking into their co-occurring alcohol- or substance-related disorders (Substance Abuse and Mental Health Services Administration [SAMHSA], 2010). There is a lack of studies focusing on CODs of alcohol or substance users. As to the hospitalized patients with CODs, little data are available in current literature that has compared patients with alcohol- or substance-related disorders with and without clinical mental disorders to identify possible clinical differences.

The purpose of this article is to (a) describe the national estimates of hospitalizations due to CODs among patients with alcohol- or substance-related disorders using the Nationwide Inpatient Sample (NIS) and (b) compare the length of stay (LOS) and hospital charges between hospitalized patients with alcohol- or substance-related disorder with and without CODs.

2. Methods

2.1. Data source

We conducted a retrospective analysis of 5 years (2003 to 2007) of hospitalization data for patients with alcohol- or substance-related disorders using the NIS of the Healthcare Cost and Utilization Project (HCUP). The NIS is the largest all-payer inpatient care database in the United States. It is the only national hospital database with charge information on all patients, including persons covered by Medicare, Medicaid, private insurance, and the uninsured. Each year, the NIS collects data on 5 to 8 million inpatient stays from approximately 1,000 hospitals located in as many as 38 states. These hospitals are defined as “all nonfederal, short-term, general, and other specialty hospitals, excluding hospital units of institutions” (HCUP, 2006). Using a complex algorithm that is based on five hospital character-

istics (e.g., ownership/control, bed size, teaching status, urban/rural location, and region), NIS data can be weighted to represent the total number of hospital discharges in the United States (HCUP, 2006).

2.2. Subjects

To select our study subjects, we used the Clinical Classifications Software (CCS) for the *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)*, a uniform and standardized coding system developed by HCUP that classifies diagnosis and procedures into clinically meaningful categories based on the *ICD-9-CM*. All hospitalizations with a primary diagnosis (dx1) of an alcohol- or substance-related disorder between 2003 and 2007 were selected from the NIS, excluding patients who died during their hospital stay ($n = 1,245$), who were admitted to the hospital for labor and delivery ($n = 60$), who were younger than 18 ($n = 8,261$), and who were admitted from long-term care facilities ($n = 5,595$; HCUP, 2006). Therefore, a total of 449,247 hospitalizations during the study period were included in this analysis.

2.3. Main variables and measures

COD, the co-occurrence of alcohol- or substance-related problems and mental disorders, was defined in this study as hospitalizations with a primary diagnosis (dx1) of an alcohol- or substance-related disorder (CCS diagnosis codes of 660 and 661) and a secondary diagnosis (dx2 to dx15) of mental disorders (13 CCS diagnosis codes of 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 662, 663, and 670). Patients with any of the thirteen mental disorder codes as a secondary diagnosis were classified as having a COD. Patients who did not have these codes as secondary diagnosis were classified as having a sole diagnosis.

LOS was defined as the total number of days elapsed between the admission and discharge date.

The hospital charges per discharge were determined at the time of hospital discharge. These charges represent the amount that each hospital billed for their services, which may not be equal to the actual cost of hospital services. For example, professional fees, emergency transportation costs, subsequent rehabilitation costs, and/or hospital discounts that insurance companies negotiated for on behalf of their patients are not included in the hospital charges (HCUP, 2006).

Patient variables included in the analysis were gender, age group, race, and insurance type. Clinical characteristics included admission source, severity of illness, type of mental health disorders, and discharge status. The severity of illness was based on the presence of a substantial complication or comorbidity, incorporating principal diagnosis, age, interactions of multiple secondary diagnoses, and combinations of nonoperating procedures with principal diagnosis (HCUP, 2006). The hospital variables were hospital region, location, bed size, and teaching status.

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