

Disparities in Hospitalization for Diabetes Among Persons With and Without Co-occurring Mental Disorders

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Objectives: This article describes differences in hospitalization for diabetes among persons with diabetes who did or did not have co-occurring mental illness and who presented in the emergency department of a large county hospital located in the Southwest. **Methods:** Four and a half years of administrative data were used and consisted of all emergency visits for diabetes (N=4,275) made by persons with and without co-occurring mental disorders. The dependent variable was whether the emergency visit resulted in hospitalization. Generalized estimating equations adjusted for age, gender, and race were used to identify differences in hospital admission between those with no co-occurring mental illness and those with any mental illness, including psychotic illness (schizophrenia or bipolar disorder) and nonpsychotic illness (depression or anxiety). **Results:** Persons with diabetes and co-occurring mental illness were less likely than those without mental illness to be hospitalized after an emergency department visit (adjusted odds ratio of .65). Persons with diabetes and co-occurring nonpsychotic disorders were at especially high risk (adjusted odds ratio of .55) to not be admitted. **Conclusions:** This study provides more evidence demonstrating disparities in physical health treatment for persons with co-occurring mental disorders. Persons with diabetes and anxiety or depression appear to be at greatest risk in this service setting. Further research is needed to identify persons with mental illness who receive poor physical health care to understand the reasons for disparities and to devise interventions to ensure appropriate medical care for those with mental illness. (*Psychiatric Services* 57:1126–1131, 2006)

Over the past several years a series of studies have examined disparities in physical health care for persons with mental illness compared with those without

mental illness. Significant disparities in access to and use of medical services, receipt of preventive care, and quality of care for medical problems have been found in some (1–5), but

not all (6–12), of these studies. Many have used administrative data from the Department of Veterans Affairs (VA) (1,4,7–10), although some have used data from Medicare (2,3) or from surveys (5,6,11,12). In general, studies examining VA administrative data have been less likely to find disparities in care, presumably because the VA is unique among public systems of care in that it offers comprehensive mental and physical health care services (8). Studies are needed to further describe disparities in health care involving persons with mental disorders, particularly in non-VA settings, and to identify specific groups at high risk for poor care. It is important to devise and implement interventions to reduce or eliminate these disparities.

Diabetes is common among persons with psychotic disorders (13,14), and depression is considered a risk factor not only for the development of diabetes (15,16) but also for poorer physical health outcomes (17). To investigate the extent to which disparities exist in hospitalization for diabetes of persons with and without co-occurring mental disorders, we used administrative data from the emergency department of a large county general hospital in the Southwest. Our hypothesis was that persons with diabetes and co-occurring mental disorders would be less likely to be hospitalized for diabetes than persons with diabetes and no mental disorders. We also hypothesized that those with psychotic disorders would be

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least likely to be admitted because we know that these individuals are at risk for stigma, stereotyping, and discrimination in many life domains.

Methods

Data source

The academically affiliated hospital from which these emergency department data originated serves primarily indigent patients and is the designated trauma center for an urban county of over three million inhabitants. Between 80 and 85 percent of the patients using this hospital are uninsured. The emergency department includes separate but contiguous sites for medical and psychiatric emergency evaluation, and the two emergency departments work closely together. When a patient enters the emergency department, he or she is first evaluated at the triage desk, which is operated by nursing staff, and is routed to either the psychiatric or medical emergency department, depending primarily on the presenting complaint. Even after the individual is routed to one or the other, consultation across the two departments is common. For example, if a person with schizophrenia in diabetic ketoacidosis presented at the triage desk, he or she would most likely be sent to the medical emergency department. While there, this patient might well receive a consultation from the psychiatric emergency department.

The emergency department records used in this analysis constituted a single data set. They did not reflect which emergency department had been in charge of the patient's care but did reflect the primary diagnosis for the visit. The database structure used for the emergency department as a whole allows for the recording of four diagnoses per visit, with one diagnosis indicated as primary. This database listed only one diagnosis for most visits (67 percent). To capture as much diagnostic information about individual emergency department users as possible, we assigned our own diagnoses for individual patients using all diagnoses available for all emergency department visits that occurred during the four and a half years of data collection.

Every visitor to the psychiatric emergency department received diagnoses based on to *DSM-III-R* or *DSM-IV* (18,19). All psychiatric diagnoses were made by attending psychiatrists or by psychiatric residents supervised directly by the attending staff. During the study period, there were only three attending psychiatrists on staff, which likely strengthened consistency in psychiatric diagnosis. Diagnoses of physical health problems were made in the general medical emergency department by interns, residents, or fellows in various primary care and specialty training programs and by attending staff.

In addition to the diagnoses given at each visit, demographic and patient entry data were recorded by nursing staff. Demographic information included the patient's gender, race or ethnicity, and age. Race or ethnicity was determined by emergency department staff. The means of arrival was categorized as escorted by police, brought in by ambulance, or self-referred. All data that were entered were reviewed contemporaneously by one staff person who checked their accuracy by comparing them with the medical record. Four and a half years of data were used because this was the period during which the data quality was monitored by the staff person.

Sample selection

The data set used for this analysis consisted of all visits to either the psychiatric or medical emergency department made between January 1994 and July 1998 by individuals 18 years of age or older. Institutional review board approval was obtained. We extracted two sample groups: patients who had at least one primary psychiatric diagnosis over the four-and-a-half-year period ($N=12,215$) and patients who had only primary general medical diagnoses—that is, who had no primary psychiatric diagnoses over the four and a half years ($N=180,030$). All persons with at least one visit with a primary psychiatric diagnosis were then grouped into four categories on the basis of *ICD-9* codes: schizophrenia, bipolar disorder, depression, and anxiety. We excluded 2,982

patients with less common psychiatric diagnoses, such as mental retardation, somatization disorders, impulse control disorders, eating disorders, sexual disorders, and sleep disorders. The diagnostic category of schizophrenia included schizophrenia, schizoaffective disorder, and psychosis not otherwise specified (*ICD-9* codes 295, 297 and 298). Bipolar disorder included mania or bipolar disorder of any type (*ICD-9* codes 2960, 2961, and 2964–2969). Depression included depressive disorders ranging from dysthymia to major depression, including depressive episode with psychotic features (*ICD-9* codes 311, 2962, 2963, and 3004). Anxiety included anxiety, phobic, and obsessive-compulsive disorders (*ICD-9* codes 3000, 3002, and 3003). Each patient was placed in a category on the basis of the diagnosis received during a majority of visits. In rare cases where there were an equal number of visits that were recorded with more than one diagnostic category, the patient was placed in the more severe illness category. Schizophrenia was considered to be the most severe disorder, followed by bipolar disorder, then depression, and then anxiety last.

Having identified two groups of patients—those with at least one primary psychiatric diagnosis and those with only general medical diagnoses—we then identified all of their emergency department visits with a primary diagnosis of diabetes; this formed our final sample of visits ($N=4,275$). Visits made by persons with schizophrenia or bipolar disorder were combined into a psychotic group, whereas visits made by persons with a primary diagnosis of depression or anxiety were classified as nonpsychotic.

Analysis plan

The focus of the study was to examine the association between hospitalization for diabetes and the presence or absence of a co-occurring mental disorder. Simple descriptive statistics were used to characterize the sample. Because visits were nested in patients' data, generalized estimating equations (SAS/STAT) (20)

Table 1

Descriptive statistics for emergency department visits (N=4,275) from persons with diabetes as the primary diagnosis

Variable	Co-occurring mental disorders							
	Any (N=268; 6%)		Psychotic (N=136; 3%)		Nonpsychotic (N=132; 3%)		No mental illness (N=4,007; 94%)	
	N	%	N	%	N	%	N	%
Age (M±SD)	43.7±11.5		40.8±10.3		46.8±12.0		47.3±13.2	
Male	100	37	71	52	29	22	1,908	48
Race								
White	47	18	20	15	27	21	513	13
African American	165	62	104	77	61	46	1,958	49
Hispanic	53	20	12	9	41	31	1,426	36
Other	3	1	0	0	3	2	110	3
Brought in by ambulance	90	34	47	35	43	33	987	25
Arriving from 11 p.m. to 7 a.m.	41	15	25	18	16	12	498	12
Hospitalized for diabetes	54	20	33	24	21	16	1,197	30

were used to account for clustering. The dependent variable was whether or not hospitalization occurred at the conclusion of the emergency department visit. Independent variables included diagnosis, classified into one of three categories—co-occurring psychotic disorders, nonpsychotic disorders, or no mental illness, which was selected as the reference group. Covariates included age, gender, and race or ethnicity (with white as the reference group). The variables available in the administrative data provided no information about clinical status other than diagnoses, so we included two additional covariates as proxy measures for illness severity, time of arrival at the emergency department (11 p.m.–7 a.m. compared with all other times) and the mode of arrival (by ambulance compared with all other modes). We considered being brought to the emergency department by ambulance or arriving between 11 p.m. and 7 a.m. to be indicators of acute need or more severe illness.

Results

As shown in Table 1, of the 4,275 visits for diabetes only 268 visits (6 percent) were made by persons with diabetes and co-occurring mental disorders. A total of 136 visits (3 percent) were made by persons with co-occurring psychotic disorders, and 132 (3 percent) were made by persons with co-occurring nonpsy-

chotic disorders. Visits by those with mental disorders differed from visits by those without mental illness in that the patients with mental illness were slightly younger (43.7 compared with 47.3), less likely to be Hispanic (20 percent compared with 36 percent), more likely to be brought in by ambulance (34 percent compared with 25 percent), and less likely to be hospitalized (20 percent compared with 30 percent). Compared with persons with psychotic disorders, those with nonpsychotic disorders were less likely to be male (52 percent compared with 22 percent), and visits from persons with psychotic disorders were more likely to be made by African Americans (77 percent compared with 46 percent) and more likely to occur at night (18 percent compared with 12 percent).

Compared with visits made by persons without co-occurring mental disorders, visits made by persons with mental illness were less likely to result in hospitalization for diabetes in both bivariate and multivariate analyses. With no adjustments for covariates, the odds of hospitalization for persons with any mental disorder were .59 times those for persons with no psychiatric comorbidity. These findings changed slightly when adjusted by the covariates noted above (adjusted odds ratio [OR]=.65) (models not shown). Unadjusted ORs for groups with and without psychotic

disorders compared with the group with no psychiatric disorders were .75 and .44, respectively.

Table 2 shows adjusted ORs of hospitalization for the group with psychotic disorders and for the group without psychotic disorders separately compared with the general medical group. Persons with depression and anxiety were significantly less likely than those without mental illness to be hospitalized for diabetes after the analysis controlled for demographic variables and other covariates (OR=.55). However, this association was not observed for those with psychotic illnesses after covariates were included. There were no significant differences between the groups with and without psychotic illness in the likelihood of being hospitalized (OR=1.39).

An examination of the covariates indicates that visits made by the youngest group (younger than 30 years) were more likely to result in hospitalization for diabetes compared with visits made by the oldest group (52 years or older) (OR=1.28). Visits by men and visits by ambulance were significantly more likely to result in hospitalization (ORs=1.48 and 2.44, respectively), and, compared with visits by whites, visits by African American or Hispanic persons or persons of other ethnicity (primarily Asian) were less likely to result in hospitalization (ORs=.66, .66, and .43, respectively).

Discussion

Using data from an urban emergency department in a large southwestern city, we found that persons with diabetes and any co-occurring mental illness were significantly less likely to be hospitalized for diabetes after presenting in the emergency department than were those without co-occurring mental illness. Persons with diabetes and nonpsychotic co-occurring disorders (depression and anxiety) were at greatest risk to not be admitted for diabetes. Our hypothesis that persons with diabetes and psychotic disorders would be least likely to be hospitalized was not confirmed. This finding adds to the literature documenting disparities in physical health care for those with co-occurring mental illness, particularly for those with nonpsychotic disorders (21–24).

Pinpointing a cause for disparities is difficult. Most believe disparities result from a complex set of factors, including socioeconomic issues, access to care, help-seeking behaviors, and environmental factors (21–24). People who have diabetes and co-occurring mental illness, especially those with depression or anxiety, may be less likely to have health insurance or may have lower incomes than those without mental illness. Compared with persons with nonpsychotic disorders, persons with schizophrenia or bipolar disorder may be more likely to receive Social Security income and to be eligible for Medicaid or Medicare. Even though this county hospital routinely admits uninsured patients, it is possible that those with insurance or those able to pay their bills are favored in admission decisions. Those who know they are unable to pay for services may refuse admission. All of these factors would argue for a differential in access to hospitalization that could explain the disparities we found. However, given that a major part of this hospital's mission is to serve indigent patients and that between 80 and 85 percent of patients admitted have no insurance, such access issues might be less important at this hospital than in other care settings.

It is possible that persons with diabetes and psychotic illnesses were more acutely ill when they came to

Table 2

Results of generalized estimating equations for likelihood of hospitalization for diabetes after emergency department visits presenting with a primary diagnosis of diabetes

Variable	OR	95% CI
Diagnosis (reference group: general medical)		
Psychotic	.77	.45–1.33
Nonpsychotic	.55	.33–.93
Age (reference group: 52 or older)		
30 or younger	1.28	1.02–1.61
31–40	.97	.77–1.23
41–51	1.01	.80–1.29
Male	1.48	1.26–1.74
Race (reference group: white)		
African American	.66	.53–.82
Hispanic	.66	.53–.84
Other	.43	.26–.73
Arriving from 11 p.m. to 7 a.m.	1.07	.85–1.35
Brought in by ambulance	2.44	1.97–3.03

the emergency department than those with nonpsychotic illnesses. Assuming that physicians' decisions are based in large part on patients' illness severity or acuity, co-occurring mental illnesses might affect the course of physical illness through a number of routes. Persons with diabetes and depressive or anxiety disorders may be more fearful of hospitalization or more likely to present with somatization or with nonacute symptoms related to diabetes.

In addition, one might expect co-occurring mental illness to interfere with an individual's self-management of chronic medical disorders, increasing the likelihood that emergent care would be needed. Indeed, poor self-management has been suggested as a reason for poorer physical health outcomes for persons with co-occurring depression (17). In contrast, some have recently argued that self-management of a chronic psychotic mental illness might actually promote the development of skills needed for managing co-occurring chronic physical illnesses (11). Poor self-management skills might not only increase the frequency of seeking emergent care but also result in visits with higher illness acuity. Unfortunately, we cannot know the extent to which such skills are relevant to our findings.

Some evidence suggests—at least for disparities based on race—that

physicians' stereotypes and prejudices, or problems in cross-racial doctor-patient communication, play a role (22,24). Evidence shows that mentally ill persons, especially those with chronic psychotic disorders, are not only stigmatized and stereotyped (25,26) but also subjected to discrimination in many areas, including employment, housing, educational opportunities, and health insurance coverage (27–31). Prejudicial attitudes also may influence the decision to admit persons with diabetes and co-occurring mental illness. However, our hypothesis that persons with psychotic disorders would be less likely to be hospitalized because of stigma was not supported by our findings. If stigma or stereotyping played a role in the admission process, it would seem to have either prevented hospitalization of those with depression or anxiety disorders or encouraged hospitalization of those with psychotic disorders. Persons with psychotic disorders may be viewed by emergency department physicians as more vulnerable or more dangerous and therefore in need of closer supervision than those without mental illness or with less severe mental illnesses.

Recent studies (6,11,12) have found that severely mentally ill persons who receive consistent and ongoing mental health care in the community are as likely as those without

mental disorders to also receive outpatient physical health treatment. Many persons with psychotic disorders receive case management through community mental health clinics, which could affect the consistency and continuity of both their mental and physical outpatient care. Unfortunately, we have no way of knowing whether any of our patients with co-occurring mental disorders were receiving ongoing mental health treatment or case management at the time of their presentation to the emergency department, but patients with diabetes and psychotic disorders may have been more likely than those with nonpsychotic disorders to receive these services, thus reducing inappropriate visits to the emergency department.

That men were significantly more likely than women to be hospitalized is noteworthy. Possibly men delay seeking health care until their symptoms are very severe. It is also possible that, as other studies have found (32,33), a true gender disparity exists in physicians' decision making. In addition, we found that African Americans, Hispanics, and those in the "other" racial category were less likely than whites to be hospitalized. Disparities in health care based on race or ethnicity are well documented (34). Among visits made by African Americans with co-occurring mental illness, 63 percent of diagnoses were for psychotic disorders compared with 42 percent for whites and only 22 percent for Hispanics. This may reflect what other studies have suggested, namely that providers are more likely to assign psychotic diagnoses to African Americans (35–37).

Results of this analysis should be interpreted with caution. No information on key predictors of access (insurance status, income, or education) was available. Because the data set contained no clinical information with which to measure severity of diabetes or symptoms at presentation, we relied on proxy measures of severity. The decision to admit a patient for diabetes would presumably be based in part on laboratory data, and we had no access to this information. In addition, we note that being hospitalized is not necessarily better

than not being hospitalized. More important is the extent to which hospitalization can be judged to be clinically appropriate, and our findings shed no light on this issue.

The number of persons with any mental disorder in this data set was not large. The results might differ with a larger sample size and more power to detect true differences. Furthermore, the emergency department assessments were usually made by residents—albeit well-supervised residents—who had not completed their training. Finally, it is unclear to what extent these findings are generalizable. This urban setting has a large population of African Americans (18 percent of the population) and, similar to many cities in the Southwest, a large immigrant Hispanic population (22 percent of the population). Depression and anxiety are far more common than psychotic disorders, yet we found roughly equal numbers of visits made by persons with diabetes and psychotic or nonpsychotic disorders. It is likely that a significant amount of depression and anxiety was undetected.

Conclusions

In conclusion, when persons with diabetes and co-occurring mental illnesses presented to an emergency department in the southwestern United States, they were much less likely to be hospitalized for diabetes than persons with diabetes and no co-occurring mental disorders. This finding was driven by the fact that persons with co-occurring nonpsychotic disorders, rather than psychotic disorders, were less likely to be admitted. Possibly these disparities were related to a lack of insurance or other resources. More attention to disparities and stigma associated with more common, less severe mental illnesses, such as depression and anxiety, may be warranted, and more studies examining the interaction between mental illness and the course of physical disorders are needed. A better understanding of the admission process and emergency physicians' decision-making processes could help identify the kinds of interventions that might reduce these disparities.

Acknowledgments

This research was supported by the South Central Veterans Affairs Mental Illness Research, Education, and Clinical Center. The authors thank Judy Keys for her assistance with data collection and Geoff Curran, Ph.D., and Keith Williams, Ph.D., for help in data analysis.

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