

Depression and Costs of Health Care

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Background: *In spite of its global importance, the interaction between depression and chronic comorbid diseases remains incompletely understood with regard to prevalence, severity of disease, and potential causative factors mediating this interaction.* **Objective:** *The authors sought to compare overall medical costs in nondepressed and depressed individuals.* **Method:** *Insurance claims for 618,780 patients were examined for total annual non-mental health cost of care in 11 chronic diseases. In each disease cohort, median annual non-mental health cost was calculated for individuals with and without depression.* **Results:** *Patients with depression had higher median per-patient annual non-mental health costs than patients without depression in all 11 diseases studied. There was a higher-than-random comorbidity between depression and all 11 chronic comorbid diseases.* **Conclusion:** *Even when controlling for number of chronic comorbid diseases, depressed patients had significantly higher costs than non-depressed patients, in a magnitude consistent across 11 chronic comorbid diseases.* (Psychosomatics 2009; 50:392–401)

Chronic diseases constitute a growing proportion of total global disease burden¹ and are projected to increase to 60% of global disease burden by the year 2020.² Depression is currently ranked fourth of all causes of global disease burden, and is projected to rise to second by 2020.² However, in spite of its global importance, the interaction between depression and chronic comorbid diseases remains incompletely understood with regard to prevalence, severity of disease, and potential causative factors mediating this interaction.³

Over the past 25 years, a growing body of evidence has established an association between depression and high utilization of general medical services. Recent studies of this issue have used cost of services as a measure of utilization of care and have quantified the increased cost of

general medical services associated with depression in several different medical settings.

Five studies^{4–8} have compared overall medical costs in nondepressed and depressed individuals and have found annual costs ranging from \$686⁶ to \$4,635⁸ higher in depressed patients. Four studies of diabetic patients have found the total annual medical cost of depressed patients to be higher than that of nondepressed patients by ratios that ranged from 1.6 to 4.5.^{9–12} One study of patients with congestive heart failure (CHF) found the cost of those with depression was 1.29 times the cost of non-depressed patients.¹³

Although there is some consistency in the magnitude of cost differences reported in these studies, the relative magnitude between various chronic comorbid diseases remains unclear. Thus far, there has been no attempt to measure and compare the cost differences associated with depression in the most prevalent chronic comorbid diseases in a primary-care population.

Furthermore, the cause of higher cost in depressed patients remains unknown. It is unclear whether these individuals suffer chronic comorbid diseases of greater

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severity, or are simply seeking more medical care than nondepressed individuals, independently of disease severity. If they are suffering from disease of greater severity, is this due to poor compliance with medical care, alterations in pathophysiology triggered by depression, or other, unidentified factors? Considering the medical and economic importance of these questions, there has been surprisingly little progress in answering them.

The objectives of this study were 1) to examine the association between depression and cost of non-mental health care in 11 chronic comorbid diseases; and 2) to examine patterns of utilization of services, comorbidity, and prevalence for evidence of causation between depression and 11 chronic comorbid diseases.

Administrative datasets allow accurate measurement of medical costs across large populations and a wide range of treatment settings.¹⁴ They also sometimes reflect real-world patterns of utilization and medical practice more accurately than data from randomized trials. For these reasons, a large administrative dataset was considered the optimal basis for measuring the cost of health care in different disease states.

METHOD

We used a cross-sectional, case-control design, using medical claims data compiled by D2 Hawkeye, Inc., a medical analytics company based in Waltham, MA.

The database for this study consisted of de-identified medical claims data for 618,780 patients in self-insured plans. Only patients enrolled in an insurance plan for the entire 12-month study interval were included. The geo-

graphical distribution of patients was mainly in the eastern United States, Texas, and California. No Medicare or Medicaid recipients were included. The study interval was September 1, 2004 to August 31, 2005.

All insurance-based healthcare utilization by study subjects was reflected in this database. Claims were classified as Inpatient Care, Outpatient Care, Emergency Room Care, and Pharmaceutical Charges. They were then entered into the computerized database with only age, sex, zip code (first three digits), and individual subject number as identifiers.

All diagnostic codes were ranked in order of 12-month prevalence, defined as number of patients per 1,000 who received that code one-or-more times in the study period. Any code that failed to identify mainly chronic disease, meaning disease requiring care for years or decades, was excluded. A large drop in prevalence between congestive heart failure and the next most prevalent chronic comorbid disease, scoliosis, made this the most appropriate cutoff point for creating a cohort that represented the most prevalent chronic comorbid diseases in this dataset. The remaining 41 individual diagnostic codes were then grouped into 11 chronic comorbid diseases (Table 1). To further exclude non-chronic diseases, study subjects were not assigned a diagnosis of a chronic comorbid disease unless they had at least two outpatient visits or one inpatient admission under any one of these ICD-9 codes during the 12-month study interval. The chronic comorbid disease did not have to be the primary diagnosis.

The identification of depressed patients by diagnostic codes alone is compromised by low sensitivity, because of

TABLE 1. Number of Members in Each Disease Category

	Total	Non-Depressed	On Antidepressants or Diagnosed, But Not Both	Diagnosed; On Antidepressants
Asthma	5,406	3,722	1,291	393
Back pain	13,434	9,153	3,319	962
CHF	1,131	755	320	56
CAD	5,758	4,359	1,205	194
Diabetes	20,843	15,752	4,270	821
Epilepsy	1,597	1,122	331	144
Headache	9,133	5,116	3,178	839
Hypertension	20,624	15,726	4,197	701
IVDD	13,158	8,835	3,393	930
Obesity	1,341	822	345	174
Joint pain	15,575	11,052	3,576	947

Diagnosed: with depression; CHF: congestive heart failure; CAD: coronary artery disease; IVDD: intervertebral disc disease.

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