

Association of Comorbidity with Depression Treatment Adequacy among Privately Insured Patients Initiating Depression Treatment

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Abstract

This study examined the association among comorbidity, type of depression treatment, and depression treatment adequacy among privately insured depression patients using claims data from 165,569 employees. Individuals newly diagnosed with depression (n = 2364) were identified using ICD-9 diagnosis codes. Logistic regression models were used to determine if certain medical and psychiatric comorbidities were associated with depression treatment type (medication only, psychotherapy only, or combined treatment) and treatment adequacy. Approximately half of the sample (56.7%) received medication only, 26.8% received psychotherapy and medication, and 16.5% received psychotherapy only. The medication only group had the highest rate (50.2%) of receiving minimally adequate treatment, while those who received the combined treatment had the lowest rate (21.0%). Patients with comorbid anxiety disorders were significantly more likely to receive combined treatment or psychotherapy alone. Those who had comorbid musculoskeletal pain were significantly more likely to receive combined treatment. After controlling for treatment type, patients with comorbid diabetes and asthma had higher rates of receiving adequate treatment than patients with other comorbid conditions. There is a continuous need for practice-system level in-

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Interventions to improve the proportion of privately insured patients with new depressive episodes who receive adequate depression treatment.

Keywords

Depression, Comorbidity, Treatment Adequacy

1. Introduction

Depression is a common and costly problem in American workplace (Kessler, Merikangas, & Wang, 2008). Beyond the employer health care costs associated with depression, several reviews of the literature suggest a close association between depression and decreased occupational functioning (Lagerveld et al., 2010; Simon, 2003). Depression is significantly associated with increased absenteeism and lost productivity while at work (Kessler, Greenberg, Mickelson, Meneades, & Wang, 2001; Kessler et al., 2008; Stewart, Ricci, Chee, Hahn, & Morganstein, 2003), which together result in an estimated annual loss of 225 million workdays, and \$36.6 billion in salary-equivalent lost productivity (Kessler et al., 2008).

While effective treatment exists in the form of medication and psychotherapy (American Psychiatric Association, 2000; Hepner et al., 2007), most working individuals diagnosed with major depression do not receive sufficient treatment (Kessler et al., 2008). In fact, when examined against national guidelines for the treatment of major depression, the studies of large-scale community indicate that only 22% - 26% of adults with major depression receive minimally adequate treatment (Kessler et al., 2003; Young, Klap, Sherbourne, & Wells, 2001), and many adults delay treatment (Ki et al., 2014).

Various patient-level factors have been associated with receiving insufficient depression treatment, including race, age, and insurance status. African Americans and older adults have been shown to be significantly less likely to receive guideline concordant depression care, and uninsured individuals less likely to initiate any type of depression treatment (Alegria et al., 2008; Harman, Edlund, & Fortney, 2004). Patient adherence behaviors also interfere with the delivery of adequate depression treatment. Patient-level predictors associated with lower adherence to antidepressant medication include younger age (Edlund et al., 2002), fewer years of education (Olfson, Marcus, Tedeschi, & Wan, 2006), minority status (Arnow et al., 2007; Olfson et al., 2006; Warden et al., 2007), better perceived physical functioning (Warden et al., 2009), and type of medication (Machado, Iskedian, Ruiz, & Einarson, 2006; Tai-Seale, Croghan, & Obenchain, 2000). Lower adherence to psychotherapy is associated with all but the final two of the above patient-level factors (Arnow et al., 2007; Edlund et al., 2002), and is further affected by referral source (Hampton-Robb, Qualls, & Compton, 2003), poorer therapeutic alliance (Arnow et al., 2007), and perceived practical barriers to treatment (e.g. cost, transportation) (Mohr et al., 2006).

In depression treatment lasting longer than 12 weeks, adherence appears to increase when the intervention is a combined medication-psychotherapy approach as opposed to medication alone (Pampallona, Bollini, Tibaldi, Kupelnick, & Munizza, 2004). Where individuals receive care is another characteristic associated with depression treatment adherence. Multiple studies suggest that patients receive adequate levels of treatment significantly more often when seeing mental health specialists (psychiatrists, psychologists, or mental health practitioners) either alone or in conjunction with primary care physicians as compared to those receiving treatment solely from the general medical sector (Jordan, Lee, Valenstein, & Weiss, 2007; Wang et al., 2005; Weilburg et al., 2003).

One important patient-level factor that can impact provider and intervention-level variables is the presence of psychiatric or physical health comorbid conditions. Depression has been shown to be significantly associated with physical comorbidities across all general diagnostic categories (Stranges et al., 2009), as well as multiple psychiatric comorbidities (Hasin, Goodwin, Stinson, & Grant, 2005; Kessler et al., 2003). Depression can worsen the prognosis of physical comorbidities (Evans & Charney, 2003; Simon, 2003), substantially increase medical costs (Katon, 2003), and decrease adherence to medical treatment regimens (Ciechanowski, Katon, & Russo, 2000; DiMatteo, Lepper, & Croghan, 2000). Some evidence suggests that patients with physical comorbidities are less likely to receive adequate depression treatment (Ettner et al., 2010; Rost et al., 2000), perhaps as a result of the presence of competing demands in a primary care setting (Klinkman, 1997). Other studies report the opposite. One Canadian study found that adults diagnosed with depression and a comorbid chronic medical dis-

order where more likely to receive guideline-concordant care than those with no medical comorbidity (Kurdyak & Gnam, 2004), and those with comorbid stroke or diabetes were more likely to receive psychopharmacological depression care in an American sample (Gill, Chen, & Lieberman, 2008).

Existing data on the relationship between psychiatric comorbidity and the receipt of adequate depression treatment also suggest the need for further investigation. One complicating factor in assessing this relationship is that an examination of adherence to treatment standards incorporates information about treatment initiation and treatment completion. Psychiatric comorbidities have been shown to both increase treatment seeking behavior (du Fort et al., 1999), and increase risk for attrition (Arnow et al., 2007; Howland et al., 2009; Olfson et al., 2009; Warden et al., 2007). Furthermore, the relationship between psychiatric comorbidity and attrition is complex. The latter study only found this association when mental health treatment was received in the general medical sector, and only as a predictor of attrition before the third visit (Warden et al., 2007). When treatment was provided by a psychiatrist after three visits, psychiatric comorbidities actually reduced patient dropout from treatment. Others have found that having a psychiatric comorbidity (without an additional physical comorbidity) increased the likelihood of receiving guideline-concordant depression treatment (Ettner et al., 2010). These mixed results may be related to the finding that the effect of psychiatric comorbidity on depression treatment appears specific to the type of comorbid disorder. Whereas anxiety disorders have been shown to increase the likelihood of receiving adequate depression treatment (Young et al., 2001), comorbid personality disorders have been shown to decrease this likelihood (Mulder, 2002).

Given the worsened patient prognosis associated with physical and psychiatric comorbidities (Evans & Charney, 2003; Howland et al., 2009), further research is needed to understand how to best deliver guideline-concordant depression treatment to an employed, privately insured population with comorbid disorders. While some progress has been made in understanding the impact of psychiatric and physical comorbid diagnoses on receiving guideline-concordant care (Ettner et al., 2010; Kurdyak & Gnam, 2004), less is known about how specific comorbidities impact the type of treatment recommended and treatment adequacy once treatment has begun. Greater understanding of the relationship among comorbidity, treatment type, and treatment adequacy would advance health care providers' ability to make individualized, evidence-based treatment recommendations. The aim of this study is, therefore, to determine the extent to which comorbidity impacts the receipt of adequate depression care. In the population of working adults with private health insurance, the study seeks to determine how comorbidity relates to the kind of treatment received and the level of treatment adequacy.

2. Method

2.1. Data and Study Cohort

This study used medical and pharmacy claims data from the health insurance plans of a Fortune 50 company (Company A) and a large, national non-profit organization (Company B). The dataset included all claims from Company A between April 1, 2003 and March 31, 2004 and from Company B between January 1, 2003 and December 31, 2003.

The database initially contained records for 165,569 employees and their dependents. The analytic dataset for this study was limited to adults' ages of 18-64. Claims data were then used to identify patients with new depressive episodes and attendant treatment during the study period, with new episodes signified by a depressive disorder diagnosis at least three months after the initial dates in the claims data. A validated strategy involving ICD-9 codes was used to identify persons with a new depressive disorder diagnosis (Jordan et al., 2007). The diagnosis of a new depressive disorder was based on the following criteria: a) primary diagnosis of a depressive disorder (296.2x, 296.3x, 300.4x, 309, 311.xx) in any inpatient or outpatient setting; (b) a secondary diagnosis of major depression during an inpatient stay; or (c) at least two secondary diagnoses of major depression on different days within a nine-month period in any outpatient setting. Because it was not possible to identify depressive episodes that occurred prior to the time for which we have claims data, patients with a depressive disorder diagnosis during the first three months of the claims data were excluded to ensure that the analytic sample was limited to new depressive episodes. Also excluded were patients with a bipolar disorder diagnosis, due to possible misclassification with major depression, as well as patients that did not initiate any treatment for their depressive disorder within 90 days of the index date. In total, 2,364 patients met these diagnostic criteria so depressive disorder morbidity was 1.43% in this population.

Matria Health Care provided blinded medical and pharmacy claims data for this project via a contract with

Northwestern University's Mental Health Services and Policy Program (MHSP) for research collaboration activities. The Institutional Review Board of Northwestern University approved secondary analysis of blinded medical and pharmacy data for research purposes. Informed consent was unnecessary because the data used in the analyses were de-identified.

2.2. Identifying Physical and Mental Comorbid Conditions

After identifying patients diagnosed with a depressive disorder, physical and psychiatric comorbid conditions were identified from inpatient, emergency room, and outpatient medical claims using ICD-9 codes. Consistent with a previous analysis using these data (Rhee, Taitel, Walker, & Lau, 2007), we identified the following physical health comorbid conditions: musculoskeletal pain (MSCP), injuries, hypertension, asthma, diabetes, arthritis, urinary tract infection (UTI), ischemic heart disease (IHD), coronary artery disease (CAD), arrhythmia, chronic obstructive pulmonary disease (COPD), otitis, seizure, irritable bowel syndrome, pregnancy, congestive heart failure (CHF), cancer, hepatitis C, stroke, peptic ulcer, osteoporosis, pressure ulcer, dementia, HIV, and sickle cell anemia. In addition, the following comorbid psychiatric disorders were identified: anxiety disorders, adjustment disorder, alcohol use, substance abuse, and personality disorders (Rhee et al., 2007).

2.3. Adequacy of Depression Treatment

The use of medication and psychotherapy treatments following the diagnosis of a depressive disorder in the study sample was then examined. Using a list of National Drug Codes (NDC) developed in a previous study (Jordan et al., 2007), antidepressant prescriptions filled during the study period were identified within the pharmacy claims data. Current Procedure Terminology codes (CPT) were used to identify psychotherapy treatment (individual, family, and group) billed for patients diagnosed with a depressive disorder in the medical claims data (Table 1).

Treatment adequacy, the key outcome of interest in this study, was defined as a binary variable within each treatment category: medication only, psychotherapy only, or combined medication and psychotherapy receipt of adequate medication treatment was defined as having at least 84 days of an antidepressant supply during the first 114 of a treatment period, which was consistent with the HEDIS 2008 guidelines for antidepressant medication management (National Committee for Quality Assurance, 2007). Because existing guidelines from the American Psychiatric Association (American Psychiatric Association, 2010) and HEDIS do not specify the most appropriate dose of psychotherapy for the initial treatment of depression, we used several meetings of the co-authors to achieve a consensus to define adequate psychotherapy treatment as having at least eight psychotherapy session claims within three months of the initial depression diagnosis (Wang et al., 2005). APA guidelines (2010) suggest that the combined use of antidepressant medication with psychotherapy may be the appropriate treatment for moderate to severe major depression, but do not specify the optimal dose of either treatment type. For this study, we defined adequate combined treatment as having received at least 84 total days of antidepressant medication supply during the first 114 days after depression diagnosis and at least eight psychotherapy sessions during the first 3 months after the initial depression diagnosis.

2.4. Statistical Analysis

Univariate analyses were conducted to examine the distribution of all variables. For bivariate analyses, 2-sided

Table 1. Current procedure terminology codes (CPT) for psychotherapy.

CPT codes	Labels
90846,90847, 90849	family medical psychotherapy (conjoint psychotherapy) by a physician, with continuing medical diagnostic evaluation, and drug management when indicated.
90853, 90857	group medical psychotherapy by a physician, with continuing medical diagnostic evaluation, and drug management when indicated.
90810,90812, 90814	Individual psychotherapy insight-oriented, behavior modifying and/or supportive, in an office or outpatient facility, face-to-face with the patient.
90804, 90806	Individual psychotherapy, insight oriented, behavior modifying and/or supportive, in an office or outpatient facility.

t-tests were performed on continuous variables and χ^2 tests on categorical variables. Multinomial logistic regression was used to examine which factors were associated with having received each of the three treatment types. Logistic regression was used to identify the risk factors associated with treatment adequacy. Multicollinearity among independent variables was examined and was not problematic. All data analyses were conducted at the patient level using SAS version 9.2 (SAS, 2009). Age, gender, and patient's employer were controlled in all analyses.

3. Results

3.1. Descriptive Characteristics

Among the 2,364 patients diagnosed with a depressive disorder, 73% were female with an average age of 42.8 years (SD = 12.6, a range from 18 to 64 years old). The average age of females and males in the study sample was 42.8 (SD = 12.6) and 42.4 (SD = 13.6) years old, respectively (Table 2). Approximately half of the patients (56.7%) were treated solely with medication, while 26.8% of patients received combined treatment of psychotherapy and medication. Only 16.5% of patients received psychotherapy without medication.

Table 2. Descriptive characteristics (% unless otherwise specified) (n = 2364).

	Medication Only (n = 1341)	Psychotherapy Only (n = 390)	Medication and Psychotherapy (n = 633)	Total (n = 2,364)
Mean Age (SD)*	42.7 (12.6)	41.7 (13.4)	43.7 (12.0)	42.8(12.6)
Female	73.5	68.7	73.6	73
Company[^]				
A	52.7	51.7	62.1	55.1
B	47.3	48.2	37.9	44.9
Psychiatric Comorbidity				
Anxiety disorder	19.5	35.1	33.0	25.7
Adjustment disorder	8.1	10.3	10.0	9.0
Alcohol use disorder	3.4	1.5	4.7	3.5
Other mental health conditions	2.0	2.1	2.5	2.1
Physical Comorbidity				
Musculoskeletal conditions	29.9	27.4	37.6	31.5
Injuries	17.5	18.2	18.3	17.8
Hypertension	13.6	10.0	15.6	13.5
Asthma	6.9	5.9	7.7	6.9
Diabetes	6.5	4.6	7.6	6.5
Arthritis	4.8	4.6	7.3	5.5
Ischemic heart disease	3.6	1.8	4.3	3.5
Coronary artery disease	2.6	0.8	4.1	2.7
Other physical health problems	14.5	14.9	16.9	15.4
Source of Depression Diagnosis				
Outpatient	95.9	98.5	96.8	97.2
Inpatient	4.1	1.5	3.2	2.9
Treatment Adequacy	50.2	34.4	21.0	35.2

*Age range was from 18 to 64 years old; average age among females was 42.9 (SD = 12.1), and average age among males was 42.4 (SD = 13.1). [^] Company A was a Fortune 50 company, and Company B was a large, national non-profit organization.

The most frequent comorbid conditions among the study cohort were musculoskeletal pain (31.5%), anxiety disorders (25.7%), injuries (17.8%), hypertension (13.5%), asthma (6.9%), diabetes (6.5%), arthritis (5.5%), and alcohol use disorder (3.5%).

The medication only group had the highest treatment adequacy rate (50.2%). Approximately one-third (34.4%) of patients in the psychotherapy only group received adequate treatment, and patients who received both antidepressants and psychotherapy had the lowest treatment adequacy rate (21.0%).

3.2. Predictors of Depression Treatment Group

There were several significant characteristics associated with depression treatment group (Table 3). Patients with a comorbid anxiety disorder were significantly more likely to receive psychotherapy only (RRR = 2.35, 95% CI [1.83, 3.03]) or a combined treatment of medication and psychotherapy (RRR = 1.94, 95% CI [1.56, 2.41]) rather than medication alone. Patients who had comorbid musculoskeletal pain were significantly more likely to receive medication and psychotherapy for their depressive disorder instead of medication alone (RRR = 1.35, 95% CI [1.08, 1.69]) or psychotherapy alone (RRR = 1.41, 95% CI [1.04, 1.91]). Patients with comorbid alcohol use disorder were significantly more likely to receive a combined treatment of medication and psychotherapy for their depressive disorder rather than psychotherapy alone (RRR = 3.51, 95% CI [1.22, 10.06]). Patients with comorbid coronary artery disease were also significantly more likely to receive medication and psychotherapy rather than psychotherapy alone (RRR = 4.81, 95% CI [1.01-23.03]).

3.3. Predictors of Depression Treatment Adequacy

Of the comorbid conditions identified, two were significantly associated with depression treatment adequacy after controlling for treatment group (Table 4). Patients with comorbid diabetes had significantly higher odds of receiving adequate depression treatment (OR = 1.77, 95% CI [1.21, 2.57]), as did patients with comorbid asthma (OR = 1.53, 95% CI [1.08, 2.17]).

Table 3. Predictors of depression treatment group[^].

Condition	Medication and Psychotherapy vs. Medication Only		Psychotherapy Only vs. Medication Only		Medication and Psychotherapy vs. Psychotherapy Only	
	RRR ¹	95% CI	RRR	95% CI	RRR	95% CI
Anxiety disorder	1.937***	1.557 2.410	2.352***	1.825 3.031	0.824	0.626 1.083
Adjustment disorder	1.246	0.893 1.739	1.298	0.141 1.069	0.960	0.626 1.471
Alcohol use disorder	1.359	0.746 2.477	0.388	0.141 1.069	3.505*	1.221 10.060
Other mental health conditions	0.939	0.444 1.987	1.521	0.600 3.856	0.618	0.222 1.717
Musculoskeletal conditions	1.352**	1.082 1.688	0.958	0.726 1.264	1.412*	1.042 1.912
Injuries	0.952	0.733 1.240	1.153	0.843 1.576	0.828	0.583 1.172
Hypertension	0.994	0.736 1.342	0.767	0.514 1.145	1.296	0.840 1.997
Asthma	1.029	0.709 1.496	0.845	0.520 1.374	1.218	0.718 2.065
Diabetes	1.138	0.762 1.689	0.845	0.489 1.461	1.347	0.747 2.428
Arthritis	1.305	0.858 1.985	1.080	0.610 1.910	1.208	0.664 2.199
Ischemic heart disease	0.697	0.312 1.560	0.860	0.310 2.387	0.811	0.255 2.574
Coronary artery disease	1.873	0.780 4.497	0.389	0.088 1.718	4.812*	1.007 23.027
Other physical health problems	1.040	0.788 1.372	1.185	0.848 1.659	0.877	0.606 1.269
Depression dx in inpatient setting	0.578	0.323 1.036	0.425	0.173 1.041	1.361	0.509 0.636

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; [^]Results are adjusted for age, gender, and employer.

¹Relative risk ratio, which is interpreted similar to an odds ratio.

Table 4. Predictors of depression treatment adequacy.

	OR*	95% CI
Anxiety	1.168	0.948 1.439
Adjustment disorder	0.992	0.725 1.358
Alcohol use disorder	1.120	0.612 2.049
Other mental health conditions	1.029	0.507 2.087
Musculoskeletal conditions	1.156	0.938 1.425
Injuries	0.911	0.714 1.162
Hypertension	0.821	0.617 1.089
Asthma	1.528*	1.075 2.171
Diabetes	1.767**	1.213 2.573
Arthritis	1.081	0.720 1.625
Ischemic heart disease	0.959	0.468 1.962
Coronary artery disease	0.723	0.313 1.670
Other physical health problems	1.075	0.831 1.392
Both vs. RX Only	0.209***	0.165 0.264
Psychotherapy Only vs. RX Only	0.504***	0.394 0.646

*Odds Ratio * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; ^ Results are adjusted for age, gender, employer, and depression treatment group.

4. Discussion

Consistent with findings in recent large-scale epidemiological studies (Kessler et al., 2003; Young et al., 2001), the majority of the patients in this study did not receive treatment consistent with national guidelines. Among the 2364 patients diagnosed with a depressive disorder in this study's sample, only half of the patients in the medication only group received adequate treatment. This finding is consistent with other studies of antidepressant medication adequacy in privately insured populations (Akincigil et al., 2007; Busch, Leslie, & Rosenheck, 2004). Only about one-third of patients who received psychotherapy alone received an adequate treatment. Those receiving a combined form of treatment had the lowest treatment adequacy rate (21%). A meta-analysis of treatment adherence in studies of patients receiving pharmacotherapy or combined treatment for depression found no difference in adherence rates for interventions lasting less than 12 weeks, but higher adherence for combined treatments in those last longer than this period (Pampallona et al., 2004). The differing findings in this study may be accounted for by varying definitions of adherence and adequacy across studies. In our analysis, medication treatment was considered adequate if prescriptions were filled, and not if medication was actually taken, whereas adequate psychotherapy required actual participation in eight therapy sessions. Therefore, the higher adequacy rates for the medication only group may reflect the significantly lower barriers associated with filling three prescriptions as compared to attending eight psychotherapy appointments.

Several physical and psychiatric comorbidities were significantly associated with the type of treatment that participants received. Comorbid musculoskeletal pain was more strongly associated with the receipt of combined treatment compared to the receipt of medication alone. This finding is consistent with literature that has demonstrated the efficacy of certain forms of psychotherapy in reducing the experience of pain among chronic pain patients (Vowles & McCracken, 2008). Alternatively, a combined approach to treatment may have been recommended for this patient population given the higher risk of substance abuse among individuals with comorbid chronic pain and depression (Manchikanti et al., 2007).

Individuals diagnosed with comorbid alcohol use disorder were more likely to receive combined treatment than psychotherapy alone. The increased risk of suicidality, more frequent depressive episodes, and more severe depressive symptoms associated with a comorbid substance use disorder (Davis, Uezato, Newell, & Frazier, 2008) may increase the likelihood of practitioners recommending combined treatment. Comorbid anxiety carries similar risk of greater symptom severity and increased incidence of suicidality, and has also been associated

with decreased efficacy of antidepressant treatment and increased negative side effects of antidepressant medication (Fava et al., 2008). The greater risks and symptom severity of this comorbidity may account for the increased likelihood of combined treatment in our study sample, whereas the negative effect on antidepressant treatment may account for the increased likelihood of psychotherapy only treatment.

Patients with comorbid diabetes or asthma had significantly higher odds of receiving adequate depression treatment. While studies have indicated that comorbid depression is associated with lower adherence to diabetes care (Gonzalez et al., 2008; Sung et al., 2014), much less is known about the relationship between these two medical diagnoses and adequacy of depression treatment. It is possible that individuals with chronic medical comorbidities have more opportunities to receive depression treatment or referrals from their physicians, though it is noteworthy that depression treatment adequacy varied across the chronic medical conditions considered in this study. It is also possible that chronic conditions requiring significant self-care, such as asthma and diabetes, might also lead to a higher likelihood of depression treatment adequacy among patients more adherent to their self-care.

Limitations

There are several limitations associated with this study. The health insurance datasets employed in this study were limited to one year of medical and pharmacy claims data. It was therefore not possible to precisely distinguish those individuals receiving their first ever diagnosis of a depressive disorder from those who experienced recurrent depressive episodes. For this reason, we limited the sample to individuals who received a new diagnosis of depression at least three months after the beginning of the study period to increase the likelihood that subjects' diagnoses reflected a discrete depressive episode rather than a historic diagnosis. Also due to the nature of the administrative claims data used in this study, incomplete treatment information was available. It was not possible to determine if subjects were employing other types of treatments for their depression beyond medication and insurance-billed psychotherapy.

It was also not possible to determine if those individuals filling prescriptions were in fact taking their medications. This limitation may have led to a bias in the findings, with an overestimate of the adequacy of antidepressant treatment received. While prescription fills are an imperfect measure of medication treatment adequacy, the use of large claims datasets necessitates this type of operationalization, and it has been used in previous similar studies in the past (Ettner et al., 2010). The type of depression treatment should ideally align with the severity of depression symptoms. Because claims data do not allow us to accurately assess depression severity, the focus of this study is the treatment adequacy for each of the three most common depression treatment approaches. Additionally, although lower medication and psychotherapy adherence are associated with fewer years of education and minority status (Warden et al., 2009), we are not able to examine these factors because our dataset lacks data on education level and race/ethnicity. Although the data used in this study are 10 years old and there have been changes in diagnostic strategies for several common comorbid conditions, depression treatment has not substantially changed during this time (American Psychiatric Association, 2000, 2010). Finally, because our study sample included employees from two private insurance health plans, our findings may not generalize beyond this population.

5. Conclusions

The findings of this study suggest several important implications for behavioral health services. First, the majority of individuals in this study who were diagnosed with a depressive disorder did not receive an adequate dose of pharmacological and/or psychotherapeutic treatment for their depression. Given this finding, there is a continuous need for practice-system level interventions to improve the proportion of privately insured patients with new depressive episodes and other comorbid conditions that receive adequate depression treatment. In particular, given that individuals receiving psychotherapy alone or in combination with medication were less likely to receive adequate treatment than those receiving only medication, there should be special emphasis on improving the receipt of psychotherapy among privately insured patients with depression and other comorbid conditions. If combined psychotherapy and medication appears to be the optimal treatment for certain types of depression (Pampallona et al., 2004), it is possible that addressing the barriers to psychotherapy in particular would help advance the delivery of best-practice treatment for depression. Innovative means of delivering psychotherapy, including via telephone rather than face-to-face, have demonstrated improved adherence rates, and may be a

possible solution to reduce barriers to psychotherapeutic treatment such as time, travel, and financial cost (Mohr et al., 2006). Further research is also needed to understand the provider-level factors that are associated with low usage of combined treatment for depression among these privately insured patients. While some research focus has been devoted to patient-level factors that impact treatment adequacy, far fewer studies have been devoted to understanding what barriers prevent practitioners from facilitating this optimal intervention for depression treatment.

This study also suggests the possible adaptive strength that could be found in being diagnosed with certain comorbid physical conditions along with a depressive disorder, chiefly asthma and diabetes. While depression's deleterious effects on various physical conditions has been well documented, this study suggests that patients who are more engaged in care for their comorbid conditions may be more likely to receive adequate depression treatment.

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