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Demographic and Clinical Factors Associated with Benzodiazepine Prescription at Discharge from Psychiatric Inpatient Treatment

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Abstract

Objective—We sought to characterize diagnostic and treatment factors associated with receiving a prescription for benzodiazepines at discharge from a psychiatric inpatient unit. We hypothesized that engaging in individual behavioral interventions while on the unit would decrease the likelihood of receiving a benzodiazepine prescription at discharge.

Method—This is an observational study utilizing medical chart review ($n = 1007$) over 37 months (2008–2011). Descriptive statistics characterized patient demographics and diagnostic/prescription frequency. Multivariate regression was used to assess factors associated with receiving a benzodiazepine prescription at discharge.

Results—The sample was 61% female with mean age = 40.5 (S.D. = 13.6). Most frequent diagnoses were depression (54.7%) and bipolar disorder (18.6%). Thirty eight percent of participants engaged in an individual behavioral intervention. Benzodiazepines were prescribed in 36% of discharges. Contrary to our hypothesis, individual behavioral interventions did not influence discharge benzodiazepine prescriptions. However, several other factors did, including having a substance use disorder (OR = 0.40). Male sex (OR = 0.56), Black race (OR = 0.40), and age (OR = 1.03) were non-clinical factors with strong prescribing influence.

Conclusion—Benzodiazepines are frequently prescribed at discharge. Our results indicate strong racial and sex biases when prescribing benzodiazepines, even after controlling for diagnosis.

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Conflicts of Interest

None of the authors report any conflicts of interest.

Keywords

benzodiazepine; inpatient treatment; prescribing; health disparities

1. Introduction

Benzodiazepines are powerful anxiolytics and, for short term use, are effective in reducing anxiety [1]. When patients are admitted to a psychiatric inpatient unit, they may often be given a benzodiazepine at the beginning of their stay in order to decrease their anxiety. Hallahan, Murray, and McDonald [2] found that benzodiazepines are prescribed to 51% of patients on the unit on a routine basis and to 66% of patients on an 'as-required' basis. Later, when being discharged from the unit, over a third of patients may receive a prescription for a sedative-hypnotic medication in order to continue taking the medication after leaving the hospital [3].

Benzodiazepine side effects include sedation, memory impairment, and emotional blunting and they can also have the paradoxical effect of increasing one's anxiety [1]. The primary hazard with benzodiazepines, however, is the risk of abuse and dependence. Individuals can become dependent on benzodiazepines within a few weeks and withdrawal from the medication can be difficult [1]. Moreover, patients with anxiety disorders-- some of the individuals most likely to be prescribed benzodiazepines-- are also at higher risk for alcohol dependence, a dangerous combination [4]. The American Psychiatric Association's Clinical Practice Guidelines for panic disorder state, "The benefit of more rapid response to benzodiazepines must be balanced against the possibilities of troublesome side effects (e.g., sedation) and physiological dependence that may lead to difficulty discontinuing the medication" [5]. International Clinical Practice Guidelines recognize these adverse side effects and state that benzodiazepines should not be taken for longer than four weeks at one time [6,7]. Given that a primary goal of acute psychiatric hospitalization is "instituting effective psychopharmacologic treatment" [8], there are a number of advantages to reducing the prescription of benzodiazepines at discharge (BAD)¹, including that it could reduce the risk of abuse or dependence. While many studies have examined administering benzodiazepines to patients currently on an inpatient unit [9,10], there is a scarcity of studies examining BAD. Wheeler et al. [3] examined BAD as part of a larger study. They reported that female patients and those who stayed 28 days or less were more likely receive a BAD, but these findings were statistically insignificant. Looking more broadly at prescribing practices, bias based on patient demographics can lead to inappropriate prescribing and discrepancies in treatment [11,12].

Cognitive therapy has been modified for inpatient units in order "to provide a greater frequency of contact with the patient, increased structure, intensive psychoeducational tools, a behavioral emphasis early in treatment, and frequent opportunities for learning cognitive therapy skills" [13]. Psychotherapy interventions on inpatient units have been found to be beneficial both in the short and long term. Jahangard et al. [14] found that inpatients with

¹The obvious connotation between the acronym and our study is not intended to offend or be dogmatic, but to encourage critical thinking about the study subject.

depressive disorder and borderline personality disorder who received emotional intelligence skills training reported lower levels of depression than those who received no psychotherapy at a four week follow up. Zobel et al. [15] found that inpatients who received interpersonal psychotherapy in conjunction with pharmacotherapy had significantly lower depression scores than inpatients receiving only pharmacotherapy and case management for a year after discharge and had a significantly higher remission rate at a five year follow up.

The present investigation sought to characterize diagnostic and treatment factors associated with receiving a BAD from a psychiatric inpatient unit. We were specifically interested in the influence of general demographics, clinical characteristics, engagement in individual behavioral interventions, and prescriber effects. It is common in inpatient settings for multidisciplinary teams including social workers, occupational therapists, nurses, psychiatrists, and psychologists to develop treatment plans that include behavioral interventions for depressive and anxiety related disorders. At our study site, there was an explicit process in which treatment plans were likely to prioritize behavioral intervention over prescribed-as-needed anxiolytics as a first order response to patient anxiety for many patients. Thus, a relevant treatment related question addressed whether targeted individual behavioral interventions while on the unit would lead to less utilization of BAD. We hypothesized that engaging in an individual behavioral intervention while on the unit would decrease the likelihood of receiving BAD.

2. Methods

2.1 Data

The present investigation was an observational study reviewing medical charts from a psychiatric inpatient unit at a large academic medical hospital. We requested information from patient charts that met specific inclusion criteria, discussed below, over a 37 month period (June 2008–July 2011). We then reviewed the charts and excluded any data that may have been received in error (i.e., did not match inclusion criteria).

2.1.1 Engagement in Behavioral Intervention—Our study site included numerous behavioral interventions, both in group and individual formats. Unit staff assigned patients to participation in a daily group Cognitive-Behavior Therapy (CBT) intervention. Most patients were assigned to group CBT with the primary exception being cognitive factors, such as active psychosis or severe developmental disabilities. For this study, in order to rule out individuals with active, severe mental illness or cognitive impairment, we used participation in at least one group CBT session as the primary inclusion criteria. Therefore, the range of severity for patients included in this study could vary from minimal symptoms to non-psychotic affective symptoms. We operationalized engagement in individual behavioral intervention as whether or not a patient received a one-on-one targeted intervention delivered by a psychology trainee. Unlike outpatient psychotherapy, these interventions were designed to be self-contained (1 session, although there could be more) and centered on distress tolerance and emotion regulation skills. Due to limited resources (i.e., trainees), not all patients could receive an individual behavioral intervention. Trainees

prioritized these interventions based on several factors, which included treatment team preferences and perceived need of brief individual behavioral interventions.

2.1.2 Clinical Characteristics—Patient data included diagnoses listed as primary, secondary, tertiary, etc. We considered the first diagnosis listed in the chart as the principal diagnosis and utilized the patient's principal diagnosis to analyze the impact of clinical presentation on BAD. However, given the obvious concerns related to substance use disorders (SUDs) and benzodiazepine use, we coded the presence of any SUD based on all diagnoses listed in the chart. We also used patient's length of stay as a marker of clinical severity. Similarly, we used the number of DSM-IV Axis-I diagnoses as a proxy for clinical complexity.

2.2 Statistical Analysis

We used the Statistical Package for the Social Sciences (SPSS) [16] and R 3.12 [17,18] to conduct both descriptive and inferential statistical analyses of the data. We conducted descriptive statistics to gather information about patient demographics, number of group CBT sessions attended, whether or not a patient had an individual behavioral intervention, frequency of assigned diagnoses, presence of a SUD diagnoses, and frequency of receiving a BAD. Potential predictors of BAD included demographics, diagnoses, severity, prescriber effects, and engaging in an individual behavioral intervention with a psychology trainee. We planned bivariate logistic regressions with 19 potential predictors, a multivariate logistic regression with all significant bivariate predictors, and two interactions (sex by diagnosis; race by diagnosis) for a total of 22 comparisons. Although exploratory in nature, we applied a Bonferroni corrected significance criteria of $p = 0.05/22 = 0.002$. All regression models were evaluated using the *glm* function in the R “stats” package [18].

3. Results

3.1 Sample Demographics

We received de-identified patient data from 1077 charts extracted from the electronic medical record by staff at the large academic hospital used in this study. We reviewed these charts and excluded 6.5% ($n = 70$) due to missing data or failure to meet full inclusion criteria. Thus, 1007 charts were used in our analyses. All 1007 patients had attended at least one group CBT session, displayed minimal to no psychotic symptoms, and had an assigned diagnosis at time of discharge. The majority, 61.1% ($n = 615$) were female. The mean age was 40.5 years ($S.D. = 13.6$). The youngest patient was 18 years old and the oldest patient was 99. The majority, 74.0% ($n = 745$), were white. There were 88 (8.7%) patients who had an unknown or undocumented race (see Table 1 for details).

3.2 Diagnoses

A total of 26 distinct principal diagnoses were organized into nine categories (Figure 1). A majority of patients (54.7%, $n = 551$) had a principal diagnosis of Depression/Dysthymia (Table 1). The modal number of Axis-I diagnoses was two (33.3%, $n = 335$), with the maximum being seven ($n = 4$). Many secondary diagnoses lacked conformity to DSM criteria and had ambiguous entries (e.g., “cluster A”). Given concerns over the quality of

secondary diagnoses, we excluded them from the analysis with the exception of SUDs. As it is common for SUDs to be included as secondary diagnoses, and because these disorders should have a strong influence on prescribing of benzodiazepines, we coded for “any SUD” as positive if it occurred anywhere within the Axis-I designation. Three hundred and ninety two patients (38.9%) had a documented SUD in their chart.

3.3 Factors Associated with Receiving a BAD

Of the 1007 patients analyzed in this study, 36.0% ($n = 363$) received a BAD (Table 1). We applied bivariate regression to determine the association between receiving a BAD and target factors, and then used multivariate logistic regression with significant candidate variables. Only number of principal diagnoses ($p = 0.561$) and engaging in an individual behavioral intervention ($p = 0.044$) did not meet our significance criteria in the bivariate analysis (see online supplement). All significant variables were included in the multivariate model and we included individual behavioral intervention because it was a primary focus of our investigation (Table 2, Figure 2). Patients with an unknown race or who identified as Native American were excluded from the multivariate model. Thus, the final sample included 907 subjects.

3.3.1 Demographics and Receiving a BAD—Demographic factors were also found to impact the likelihood of receiving a BAD (Table 2). Older age increased the odds of BAD ($OR = 1.03$, $p < 0.002$, 95% $CI = 1.01 - 1.04$). These findings also show that being a male significantly decreased likelihood of receiving a BAD ($OR = 0.56$, $p < 0.002$, 95% $CI = 0.40 - 0.76$). Frequencies associated with receiving a BAD also varied by race (White 39.9%, Asian 42.2%, Black 18.3%, Hispanic 12.5%, Native American 0%, Unknown 30.7%). Since none of the 12 Native American patients received a BAD, they were not included in the multivariate analysis, along with patients with unknown race ($n = 88$). The multivariate analysis ($n = 907$) showed that identifying as Black significantly decreased the likelihood of receiving a BAD compared to Whites ($OR = 0.40$, $p < 0.002$, 95% $CI = 0.22 - 0.70$). Hispanic race had a noticeable odds ratio, but did not reach our significance criteria ($OR = 0.22$, $p = 0.019$, 95% $CI = 0.05 - 0.68$). Asian race was also not significantly different from White ($OR = 1.09$, $p = 0.811$, 95% $CI = 0.55 - 2.10$).

3.3.2 Principal Diagnosis and Receiving a BAD—Relative to depression, a principal diagnosis of anxiety disorder increased the odds of receiving a BAD, but did not meet our significance criteria ($OR = 4.39$, $p = 0.008$, 95% $CI = 1.50 - 13.68$). Any SUD diagnosis decreased the odds of receiving a BAD ($OR = 0.40$, $p < 0.002$, 95% $CI = 0.29 - 0.56$). Patients with all other diagnoses were no more (or less) likely to receive a BAD than those with depression. Severity, as marked by length of stay, increased the odds of BAD ($OR = 1.09$, $p < 0.002$, 95% $CI = 1.05 - 1.14$). We tested for separate interactions between sex and SUD and race and SUD, neither of which was significant.

3.3.3 Engaging in Individual Behavioral Interventions and Receiving a BAD—Our analysis addressed the hypothesis that engagement in individual behavioral interventions would influence BAD. There were 17 psychology trainees who conducted a total of 763 individual behavioral interventions. Thirty eight percent of patients ($n = 383$)

met with a trainee at least once (mean = 2.0, min = 1, max = 10, S.D. = 1.37). Over the course of their stay, these patients met with a trainee for an average of 79 minutes (median = 60). Having seen a psychology trainee for an individual behavioral intervention had no independent impact on receiving a BAD (OR = 1.08, $p = 0.623$, 95% CI = 0.79–1.49; Table 2).

3.3.4 Prescriber Effects on Receiving a BAD—There were 24 prescribers associated with discharge notes and who were responsible for prescribing medications upon discharge. Prescriber effects may generalize across patients, thus an appropriate predictive model would nest patients within prescribers. However, the distribution of the number of discharges per prescriber was highly skewed, with one prescriber associated with 347 discharges, three with more than 100 discharges (but less than 200), three with more than five discharges (but less than 100), and 17 with five or fewer discharges. After eliminating the 16 psychiatrists who saw less than three patients, we conducted a bivariate logistic regression of BAD onto selected psychiatrists, using the prescriber with 347 discharges as the reference. None of the eight prescribers was significantly different from the reference provider (OR = 0.52, $p = 0.038$, 95% CI = 0.28 – 0.95). We then followed up, comparing this model with a null model using a Wald Test, and rejected the impact of prescriber effects on receiving a BAD (Chi-Square = 13.3, $df = 8$, $p = 0.07$). Thus, prescribers were omitted from the multivariate analysis.

4. Discussion

Our analysis of the association between diagnosis and BAD indicates that prescribers take note of important indicators, such as SUDs, and avoid prescribing benzodiazepines in these cases. Prescribers may be more likely to prescribe them for generalized anxiety disorder and/or panic disorder relative to depression, however due to the small number of patients with these principal diagnoses, we did not have power to determine if the effect was significant. Our results suggest that, while prescribers are taking diagnosis into account when prescribing BAD, they may be focused more on diagnoses for which benzodiazepines are contraindicated, rather than focusing on instances where they may be best utilized. Our results are similar to Hallahan, Murray, and McDonald [2] who found that prescribing benzodiazepines to patients while on the unit was not associated with diagnosis unless the diagnosis was alcohol dependence syndrome or polysubstance misuse. Diagnosis may not be the most important factor in using benzodiazepines on an inpatient unit for several reasons, including the important concern that almost by definition, the patient's treatment has failed if they are being admitted to an inpatient unit (albeit possibly for very good reasons). Almost all admissions are associated with a high level of psychosocial crisis and benzodiazepines are particularly good at calming individuals. Inpatient stays are typically short (mean of 7 days), and the focus is on abating the suicide risk, not eliminating all symptomatology.

Our most consistent findings were related to patient demographics and clinical severity. In particular, male sex and Black race had significant and large associations with *not* receiving a BAD. This supports Wheeler et al.'s [3] finding that women received a BAD more often than men. While prescribers may not intentionally consider sex and race, this study demonstrates that these factors do play a role in prescribing practices. The disparity in

prescribing could suggest that providers are too restrictive with benzodiazepines in men and Black patients. It could also mean that prescribers are too permissive with benzodiazepines in female, Asian, and White patients. Even though the goal with some patients is to avoid BAD, one should not interpret this study to imply that a prescribing bias was paradoxically beneficial because fewer men and Black patients were discharged on benzodiazepines. Moreover, safely tapering off of a benzodiazepine, from the perspective of medical and psychiatric stability, often needs to be done over a much longer period than the hospital length of stay. To put it another way, we do not know if, for example, 50% of patients had benzodiazepines on admission, which was reduced to 36% with benzodiazepines on discharge, with the initiation of a taper to be completed after discharge in another 10%. Combining this information with the gender and race data in future studies would be a useful way to evaluate potential biases in both inpatient and outpatient settings. We found patient severity had a relatively strong impact on BAD and this is consistent with what would be expected. A lack of relationship between severity and BAD would be concerning.

In 2012 the rate of substance dependence or abuse in adult males (12.2%) was more than twice that in females (5.7%) [19]. In our sample, the gap was not as large (49.0% of males with any SUD diagnosis compared to 32.5% of females). Despite the higher prevalence of SUDs in men in our sample, an interaction between sex and SUDs does not explain the decreased rates of BAD in men, as we included both terms in the multivariate analysis and we specifically tested for an interaction effect, which was negative; hence being male independently contributes to lower likelihood of BAD regardless of diagnosis.

While the prescribing differences related to gender and substance abuse may be influenced by population trends (not represented in this inpatient sample), the same is not true for Black and Hispanic race. In 2012, 8.7% of Whites age 12 or older had substance dependence or abuse, compared to almost identical rates for Hispanics (8.8%) and Blacks (8.9%) [19]. Asian (3.2%) and Native American (21.8%) substance abuse rates [19] were reflected in our data, with no difference in prescribing practices between Asians and Whites, and not a single Native American in our sample receiving a BAD. A recent study found that Black individuals may score lower on the GAD-7 assessment measure than whites [20]. While the providers in this study did not routinely use the GAD-7 to assist in the diagnosis of anxiety, our study contributes to the discussion that anxiety symptoms in minority populations may be missed, which may explain the lower rate of BAD in Black patients. More research is needed to determine what factors are leading prescribers to use post-discharge benzodiazepines less frequently for men and Black individuals.

Age was another significant predictor of BAD outcomes. While the odds ratio was small, 1.03, it is important that this value is multiplicative and thus increases as $(1.03)^n$ where n = number of years older than 18. Thus, for a 68 year old, the odds of having a BAD outcome increases to 4.4 (1.03^{50}) compared to an 18 year old. Although this would be particularly concerning if the trend continued up the age scale, caution must be applied as the number of participants over the age of 68 was only 16, and no single age had more than 3 individuals; hence, our regression coefficients are highly unstable at the extreme end of our age spectrum. The American Geriatric Society strongly recommends that benzodiazepines are avoided in older adults when treating insomnia, agitation, and delirium, and should only be

used to treat anxiety when symptoms are severe, due to the increased risk of “cognitive impairment, delirium, falls, fractures, and motor vehicle accidents in older adults” [21]. Unfortunately, our results match another recent study which found that, despite the American Geriatric Society’s recommendations and the increased risks, benzodiazepine use actually increases with age and longer-term use also increases [22].

Counter to our hypothesis, seeing a psychology trainee did not impact the likelihood of receiving a BAD. Although seeing a trainee was marginally significant in the bivariate analysis, the effect was eliminated when controlling for other factors. The hypothesis may not have been supported due to the fact that the individual behavioral interventions we evaluated were not necessarily targeting decreased benzodiazepine usage. Intervention limitations including the small number of sessions and lack of continuity across trainees may have also decreased the potential effect of individual behavioral interventions on BAD. Our findings indicate that if minimizing benzodiazepine use is a clinical practice goal, a single session, generalized behavioral intervention approach is not adequate.

Our analysis of prescriber effects was limited due to sample size and distribution of discharge responsibilities in the study site. The lack of significant provider effects does carry the implication that practices within a given setting may be fairly uniform, which is encouraging with respect to interventions aimed at changing prescribing practices. We did not have access to patients’ medication regimen prior to being admitted. Therefore, some patients who were prescribed BAD may have already been taking a benzodiazepine prior to entering the unit. The average length of stay on this inpatient unit is less than 15 days. Thus, the biases suggested by discharge prescription patterns may also be a reflection of outpatient prescribing biases that preceded the admission. Moreover, we do not know if there are biases in starting benzodiazepines while on the unit, in increasing the dose during the admission, in reducing the dose, or in initiating a taper of these medications to be completed after discharge. This study was designed from the framework that BAD is an undesirable outcome in general and should not occur frequently. As noted, individuals enter an inpatient unit in some form of crisis, usually already taking one or more pharmaceuticals, have a very short stay, and are often discharged both with significant levels of general symptoms and returning to the same environmental circumstances in which they entered the unit. Not surprisingly then, we found mixed evidence on the topic of BAD when conducting our literature review. We acknowledge that benzodiazepines have their role in treatment and that this study cannot illuminate the appropriateness of BAD in our sample. Our study was limited to exploring data on the prescribing practices for BAD and presenting data that suggests there is potential overuse and biased use of BAD for men and individuals identifying as Black.

Other limitations in this research include the observational design and our reliance on variables already contained within the medical record. Some chart data (e.g., secondary diagnoses) seemed unreliable and therefore we were unable to use much of this data in our analyses. Patients on this unit tend to be insured and of middle class socioeconomic status, thus influential characteristics might not generalize to all inpatient units. The majority of patients carried a depression related principal diagnosis and thus power for comparing across diagnostic categories was limited. Likewise, the minority groups were

underrepresented. Thus, trends in prescribing patterns influenced by diagnosis (particularly anxiety disorders) and Hispanic race may exist, but were insignificant in our analyses. Furthermore, as noted above, we could not include Native Americans in the regression analysis predicting BAD, as there was not a single case of BAD for the 12 Native Americans included in the sample. Odds ratios with unadjusted 95% confidence intervals for all predictors in our multivariate logistic regression are provided in Figure 2.

5. Conclusions

This study indicates that benzodiazepines are being prescribed frequently at discharge, and while prescribing appears to be informed by patient diagnosis and severity, it is also significantly influenced by the patient's sex, race, and age. This study has strong implications for prescribers who see patients with severe mental illness, as well as for institutional standards of prescribing. Prescribers need to be alert to potential gendered and racial biases that may be affecting prescribing practices. Since prescribing practices may likely be uniform throughout a unit, and prescribers may be unaware of how bias may impact their prescribing, inpatient and outpatient prescribers might benefit from systemic interventions that address implicit biases. More research is needed to determine what factors lead psychiatrists to prescribe benzodiazepines at such a high frequency, why certain populations are receiving BAD at differing rates, and what can be done to reduce the frequency of prescribing benzodiazepines.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

1. Ashton, HC. Benzodiazepines: How do they work and how to withdraw (aka The Ashton Manual). Newcastle, UK: Institute of Neuroscience, Newcastle University; c2002. [Internet]. Available from: <http://www.benzo.org.uk/manual/index.htm/> [cited 2014 Apr 14]
2. Hallahan BP, Murray IT, McDonald C. Benzodiazepine and hypnotic prescribing in an acute adult psychiatric in-patient unit. *Psychiatric Bulletin*. 2009; 33:12–14.
3. Wheeler A, Kairuz T, Sheridan J, McPhee E. Sedative-Hypnotic treatment in an acute psychiatric setting: Comparison with best practice guidance. *Pharm World Sci*. 2007; 29:603–610. [PubMed: 17333495]
4. Boschloo L, Vogelzangs N, Smit JH, van den Brink W, Veltman DJ, Beekman ATF, et al. Comorbidity and risk indicators for alcohol use disorders among persons with anxiety and/or depressive disorders: Findings from the Netherlands Study of Depression and Anxiety (NESDA). *J Affect Disord*. 2011; 131:233–242. [PubMed: 21247636]
5. American Psychiatric Association. Practice guideline for the treatment of patients with panic disorder. 2nd Edition. American Psychiatric Association; 2009.

6. McIntosh, A.; Cohen, A.; Turnbull, N.; Esmonde, L.; Dennis, P.; Eatock, J., et al. Clinical guidelines and evidence review for panic disorder and generalised anxiety disorder. London: National Collaborating Centre for Primary Care; 2004.
7. Taylor, D.; Paton, C.; Kapur, S. The Maudsley Prescribing Guidelines. 10th Edition. London: Informa Healthcare; 2009.
8. Sharfstein SS. Goals of inpatient treatment for psychiatric disorders. *Annu. Rev. Med.* 2009; 60:393–403. [PubMed: 18729730]
9. Davies SJC, Lennard MS, Ghahramani P, Pratt P, Robertson A, Potokar J. PRN prescribing in psychiatric inpatients- Potential for pharmacokinetic drug interactions. *J Psychopharmacol.* 2007; 21:153–160. [PubMed: 17329294]
10. Duxbury JA, Baker J. The use and nursing management of benzodiazepines in acute, mental health inpatient care: A discussion. *J Psychiatr Ment Health Nurs.* 2004; 11:662–667. [PubMed: 15544663]
11. Manteuffel M, Williams S, Chen W, Verbrugge RR, Pittman DG, Steinkellner A. Influence of patient sex and gender on medication use, adherence, and prescribing alignment with guidelines. *J Womens Health.* 2014; 23:112–119.
12. Meghani SH, Byun E, Gallagher RM. Time to take stock: A meta-analysis and systematic review of analgesic treatment disparities for pain in the United States. *Pain Med.* 2012; 13:150–174. [PubMed: 22239747]
13. Stuart S, Wright JH, Thase ME, Beck AT. Cognitive therapy with inpatients. *Gen Hosp Psychiatr.* 1997; 19:42–50.
14. Jahangard L, Haghighi M, Bajoghli H, Ahmadpanah M, Ghaleiha A, Zarrabian MK, et al. Training emotional intelligence improves both emotional intelligence and depressive symptoms in inpatients with borderline personality disorder and depression. *Int J Psychiatr Clin Pract.* 2012; 16:197–204.
15. Zobel I, Kech S, van Calker D, Dykieriek P, Berger M, Schneibel R, et al. Long-Term effect of combined interpersonal psychotherapy and pharmacotherapy in a randomized trial of depressed patients. *Acta Psychiatr Scand.* 2011; 123:276–282. [PubMed: 21231926]
16. IBM Corp. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp; Released 2012.
17. R: A language and environment for statistical computing. R Core Team. Vienna, Austria: R Foundation for Statistical Computing; c2014. [Internet]. Available from: <http://www.R-project.org/> [cited July 1, 2014]
18. Bates D, Maechler M, Bolker B, Walker S. lme4: Linear mixed-effects models using Eigen and S4. R package version 1.1-6. c2014 [Internet]. Available from: <http://CRAN.R-project.org/package=lme4>.
19. Rockville, MD: Substance Abuse and Mental Health Services Administration; c2013. Results from the 2012 National Survey on Drug Use and Health: Summary of national findings. [Internet]. Available from: <http://www.samhsa.gov/data/NSDUH/2012SummNatFindDetTables/NationalFindings/NSDUHresults2012.htm#ch7> [cited 2014 May 31]
20. Parkerson HA, Thibodeau MA, Brandt CP, Zvolensky MJ, Asmundson GJG. Cultural-based biases of the GAD-7. *J Anxiety Disord.* 2015; 31:38–42. <http://dx.doi.org/10.1016/j.janxdis.2015.01.005>. [PubMed: 25725310]
21. The American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. *J Am Geriatr Soc.* 2012; 60:616–631. [PubMed: 22376048]
22. Olfson M, King M, Schoenbaum M. Benzodiazepine use in the United States. *JAMA Psychiatry.* 2015; 72:136–142. [PubMed: 25517224]

Category	Primary Diagnosis % (n)	Individual Diagnoses
Depression/Dysthymia	54.7% (551)	Depression
		Major depressive disorder (MDD)
		Major depressive episode (MDE)
		MDD with psychotic features/psychosis
		MDD with antepartum onset
		MDD: mild, severe, recurrent
		Dysthymia, Dysthymic disorder
Bipolar I & II	18.6% (187)	Bipolar disorder I [(BPAD I), Bipolar disorder (BAD, BPAD), Cyclothymia,
		Bipolar disorder II (BPAD II, Hypomanic)
		Bipolar disorder: rapid cycling, with catatonic features, with psychotic features, manic episode, depressed episode
Substance Use	4.2% (42)	Any substance abuse/dependence/withdrawal
Schizophrenia	4.1% (41)	Schizophrenia (paranoid, late onset, catatonic features, Schizoaffective disorder, Schizophreniform disorder)
Psychosis	3.7% (37)	Delirium
		Psychosis (Delusional disorder, Post-partum psychosis)
Adjustment Disorder	2.6% (26)	Adjustment disorder/Acute stress disorder
Anxiety	1.9% (19)	Agoraphobia
		Generalized anxiety disorder
		Social phobia
		Panic attack/Panic disorder
PTSD	1.6% (16)	Posttraumatic stress disorder (PTSD)
All Other Disorders	8.7% (88)	Includes Borderline personality disorder, eating disorder, Obsessive Compulsive Disorder

Figure 1. Grouping of Diagnoses into Categories Category

Figure 2. Odds Ratios of Categorical Multivariate Predictors (95% CI)^a

^a Error bars represent 95% confidence intervals, unadjusted for multiple comparisons.

Table 1**Participant Demographic and Clinical Characteristics**

Demographic	Total Sample (<i>n</i> = 1007)	Received BAD- Yes (<i>n</i> = 363)	Received BAD- No (<i>n</i> = 644)
Sex, % (<i>n</i>)			
Female	61.1 (615)	25.8 (260)	35.3 (355)
Male	38.9 (392)	10.2 (103)	28.7 (289)
Mean Age, years (SD)	40.5 (13.6)	43.5 (13.4)	38.8 (13.4)
Race, % (<i>n</i>)			
White	74.0 (745)	29.5 (297)	44.5 (448)
Black	9.2 (93)	1.7 (17)	7.5 (76)
Asian	4.5 (45)	1.9 (19)	2.6 (26)
Hispanic	2.4 (24)	0.3 (3)	2.1 (21)
Native American	1.2 (12)	0.0 (0)	1.2 (12)
Unknown/Unrecorded	8.7 (88)	2.7 (27)	6.1 (61)
Principal Diagnosis			
Depression	54.7 (551)	19.8 (199)	35.0 (352)
Anxiety	1.9 (19)	1.1 (11)	0.8 (8)
Substance Use Disorder	4.2 (42)	0.3 (3)	3.9 (39)
Adjustment	2.6 (26)	0.4 (4)	2.2 (22)
Bipolar	18.6 (187)	8.6 (87)	9.9 (100)
PTSD	1.6 (16)	0.6 (6)	1.0 (10)
Psychosis	3.7 (37)	0.8 (8)	2.9 (29)
Schizophrenia	4.1 (41)	1.4 (14)	2.7 (27)
All Other	8.7 (88)	3.1 (31)	5.7 (57)
Any SUD Diagnosis	38.9 (392)	8.7 (88)	30.2 (304)
Treatment Information			
Mean Length of Stay, days (SD)	7.9 (4.5)	9.1 (5.2)	7.2 (3.8)
Mean Number Group CBT Sessions (SD)	3.7 (2.4)	4.3 (2.8)	3.4 (2.0)
Individual Behavioral Intervention, % (<i>n</i>)*	38.0 (383)	15.2 (153)	22.8 (230)
Mean Number Axis-I Diagnoses (SD)**	2.4 (1.2)	2.3 (1.2)	2.4 (1.2)

Differences by group (Received BAD Yes/No) tested by Chi-Square for categorical variables and t-test for continuous variables. All comparisons statistically significant at $p < 0.05$ unless noted.

* Groups did NOT differ, $p = 0.051$

** Groups did NOT differ, $p = 0.056$

Table 2
Multivariate Predictions of BAD

$$Y = \beta_0 + \beta_1 (Age) + \beta_2 (Sex) + \beta_3 (Severity) + \beta_4 (Race) + \beta_5 (SUD) + \beta_6 (BI) + \beta_7 (Dx) + \varepsilon$$

Predictor (<i>n</i> = 907) BAD outcome (<i>n</i> = 363, 36%)	Odds Ratio	Lower CI (95%)	Upper CI (95%)	p value
Age	1.03	1.01	1.04	< 0.0001
Male Sex (Female reference group)	0.56	0.40	0.76	0.0003
Severity (length of stay)	1.09	1.05	1.14	< 0.0001
Race (White reference group)				
Black	0.40	0.22	0.70	0.0018
Hispanic	0.22	0.05	0.68	0.0192
Asian	1.09	0.55	2.10	0.8107
Native American	0	N/A	N/A	N/A
Any SUD Diagnosis	0.40	0.29	0.56	< 0.0001
Individual Behavioral Intervention ^a	1.08	0.79	1.49	0.6230
Principle Diagnostic Category (depression as reference) ^b				
Anxiety	4.39	1.50	13.68	0.0078
Substance Use Disorder	0.33	0.08	0.99	0.0787
Adjustment	0.30	0.08	0.95	0.0568
Bipolar	1.43	0.98	2.10	0.0667
PTSD	0.75	0.21	2.40	0.6390
Psychosis	0.40	0.15	0.94	0.0439
Schizophrenia	0.97	0.43	2.09	0.9346
All Other	1.52	0.89	2.59	0.1229

Bonferonni corrected criteria for significance is $p < 0.002$

^a (This indicates the patient saw a psychology trainee as described in the text [$n = 352, 39\%$])

^b (Wald test: chi-square = 25.2, df = 8, $p = 0.0014$)