Available online at www.sciencedirect.com

ScienceDirect

Comprehensive Psychiatry 73 (2016) 23–30

COMPREHENSIVE PSYCHIATRY

www.elsevier.com/locate/comppsych

# Subjective anger and overt aggression in psychiatric outpatients

Timothy Genovese, Kristy Dalrymple, Iwona Chelminski, Mark Zimmerman*

*Department of Psychiatry and Human Behavior, Brown University School of Medicine, Providence, RI*

**Abstract**

**Background:** The attention given to anger and aggression in psychiatric patients pales in comparison to the attention given to depression and anxiety. Most studies have focused on a limited number of psychiatric disorders, and results have been inconsistent. The present report from the Rhode Island Methods to Improve Diagnostic Assessment and Services (MIDAS) project sought to replicate and extend prior findings examining which psychiatric disorders and demographic characteristics were independently associated with elevated levels of anger and aggression.

**Method:** 3800 individuals presenting to the Rhode Island Hospital Department of Psychiatry outpatient practice underwent a semi-structured interview to determine current Axis I (N = 3800) and Axis II (N = 2151) pathology. Severity of subjective anger and overt aggression within the past week were also assessed for each patient, and odds ratios were determined for each disorder. Multiple regression analyses were conducted to determine which diagnoses independently contributed to increased levels of anger and aggression.

**Results:** Almost half of the sample reported moderate-to-severe levels of current subjective anger, and more than 20% endorsed moderate-to-severe levels of current overt aggression. The frequency of anger was similar to the frequencies of depressed mood and psychic anxiety. Anger and aggression were elevated across all diagnoses except adjustment disorder. Anger and aggression were most elevated in patients with major depressive disorder, panic disorder with agoraphobia, post-traumatic stress disorder, intermittent explosive disorder, and cluster B personality disorders.

**Conclusions:** Anger is as common as depressed mood and psychic anxiety amongst psychiatric outpatients, and problems with anger cut across diagnostic categories. Given the high prevalence of problems with anger in psychiatric patients, more research should be directed towards its effective treatment.



## 1. Introduction

Of the three most common affective disturbances – depression, anxiety, and anger – anger has received the least research attention. Despite concerns about violence and aggression in our society, comparatively little research has looked at the association between anger and psychiatric diagnosis. Undeniably, many studies have looked at the relationship between anger and mood and substance disorders, but inconsistent findings and a relative lack of research investigating the relationship between anger and other types of psychiatric disorders beg further clarification.

More than a decade ago, research from the Rhode Island Methods to Improve Diagnostic Assessment and Services (MIDAS) project examined the frequency of subjective anger and overt aggression in 1300 patients presenting to an outpatient practice [1]. The study found that major depressive disorder (MDD), bipolar I disorder, intermittent explosive disorder (IED), and cluster B personality disorders independently contributed to elevated anger and aggression independently of age, gender, and comorbid Axis I and II disorders. Posttraumatic stress disorder (PTSD) and specific phobia were also found to independently contribute to increased anger, and generalized anxiety disorder (GAD) and drug abuse/dependence were found to contribute to increased aggression.

Studies of anger and aggression across psychiatric diagnoses since 2001 have consistently found elevated rates of anger, irritability, and hostility amongst depressed patients [2–4], in addition to increased lifetime aggressive [5] and twelve-month violent behavior [6]. Studies of bipolar disorder have also found elevated levels of anger [4] and consistently reported increased aggressive behavior [5–9].

* Corresponding author at: 146 West River Street, Providence, RI, 02904.

*E-mail address:* mzimmerman@lifespan.org (M. Zimmerman).

http://dx.doi.org/10.1016/j.comppsych.2016.10.008

0010-440X/

However, the picture is more complicated with the anxiety disorders. GAD has been characterized by a higher incidence of violence within the past 12 months [6], higher anger and aggression measure scores [10], and greater 30-day anger expression-related impairment [11], although Pulay et al. found that there was no significant relationship between a diagnosis of GAD and increased violence since age fifteen [9]. Inconsistent findings have also been found for PTSD [6,11], obsessive–compulsive disorder (OCD) [4,6,12], social phobia [4,6,9,11,12], panic disorder [4,6,9,11,12], and specific phobia [6,9,11,12].

Only a couple of studies have examined a variety of personality disorders and anger/aggression. The British Household Survey found an association between antisocial personality disorder and non-lethal violence [13], and the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) found that paranoid, schizoid, histrionic, and obsessive–compulsive disorders – but neither avoidant nor dependent personality disorder – were associated with increased lifetime violence since fifteen years of age [9].

The prior research harbors inconsistencies because of variations in research design — the studies show significant heterogeneity in the populations from which they draw their subjects, the treatment settings, the psychological constructs and time frames assessed, the measures used to assess the chosen constructs, the factors and covariates they choose to control for, and the use of controls. As current symptoms are of the greatest interest to clinicians, the current investigation examined subjective feelings of anger and overt expression of aggressive behavior as symptoms during the week preceding the initial psychiatric evaluation in an outpatient setting.

Recently, Cassiello-Robbins and Barlow published a review examining the relationship between anger and emotional disorders in the literature [14]. They studied affective disorders, anxiety disorders, borderline personality disorder, and IED, and concluded that each of the disorders of interest was significantly associated with anger. Their findings are not only consistent with our earlier report from the MIDAS Project, but also important in informing the hypotheses of the current study.

The prior report from the MIDAS project examined the prevalence of anger and aggression as symptoms in the patient population at Rhode Island Hospital's outpatient psychiatry practice, and studied the association between age, gender, and Axis I and II pathology and anger and aggression [1]. In the present report from the MIDAS project, we revisit the issue and extend the prior findings with a significantly larger sample size, increased from 1300 to 3800 patients, and examine a greater variety of demographic factors, including race, education, and relationship status. In non-psychiatric samples, divorced or separated relationship status [13], minority racial status [15] and lower level of education [16,17] have been associated with higher levels of self-reported violence, anger expression and subjective feelings of anger, respectively. We therefore predicted that these factors would be relevant to the frequency of anger and aggression in psychiatric samples as well. Furthermore, we also hypothesized that male gender would be associated with increased anger and aggression because this association was observed in the prior report from the MIDAS Project [1].

Given the results of the previous investigation, in addition to findings from the literature with emphasis on recent conclusions drawn by Cassiello-Robbins and Barlow [14], we predicted that MDD, bipolar I disorder, IED, cluster B personality disorders, male gender, widowed or divorced status, non-White racial status, and lower educational level would independently contribute to elevated anger and aggression.

## 2. Methods

Three thousand eight hundred patients were evaluated at the outpatient practice of the Rhode Island Hospital Department of Psychiatry in Providence, RI. This practice group predominantly treats patients with medical insurance (including Medicare but not Medicaid) on a fee-for-service basis and is distinct from the hospital's residency training clinic. All patients were interviewed with the Structured Clinical Interview for DSM-IV (SCID) [18] at the time of their first visit. Only current diagnoses were analyzed, while diagnoses that met criteria in the past or were in partial remission were excluded. Further details of the baseline evaluation are presented elsewhere [19]. The Rhode Island Hospital Institutional Review Board approved the research protocol, and all patients provided written informed consent.

The SCID was supplemented by several items drawn from the Schedule for Affective Disorders and Schizophrenia (SADS) [20]. Two of the items were used to assess levels of subjective anger and overt expression during the preceding week. The anchor points and frequency distributions for each of the items are displayed in Table 1. In analyzing the results, we transformed these ratings into dichotomous variables. Consistent with our prior analysis [1], subjective anger was defined as present if the corresponding SADS item was rated 4 or 5, and overt aggression was defined as present if the corresponding SADS item was rated 3 or greater. Cutoff scores were determined using the frequency distributions of ratings shown in Table 1. Data were not analyzed using any other cutoff scores. Interrater reliability ratings were obtained from 48 joint interviews. Kappa values for subjective anger and overt aggression were 0.61 and 0.65, respectively, indicating good interrater reliability. The reliability of psychiatric diagnoses is presented elsewhere [19].

We compared the frequency of subjective anger with the frequencies of depressed mood and psychic anxiety using the corresponding SADS items, all three of which have comparable rating scales and anchor points in the SADS.

Table 1
Severity of subjective anger and overt expression of anger in 3800 psychiatric outpatients.

| Rating | Level of Anger | N (%) |
|---|---|---|
| **Level of subjective anger during the preceding week** | | |
| 0 | Not at all, or clearly of no clinical significance | 739 (19.5) |
| 1 | Slight and of doubtful clinical significance | 543 (14.3) |
| 2 | Mild, eg, definitely more than called for by the situation but only occasional and never very intense | 723 (19.0) |
| 3 | Moderate, eg, often aware of feeling quite angry or occasionally feeling very angry | 1061 (27.9) |
| 4 | Marked, eg, most of the time aware of feeling quite angry or often feeling very angry | 597 (15.7) |
| 5 | Extreme, eg, almost constantly aware of feeling very angry | 133 (3.5) |
| **Level of overt expression of anger during the preceding week** | | |
| 0 | Not at all, only subjectively felt, or associated with manic symptoms | 1533 (40.3) |
| 1 | Slight, eg, occasional snappiness which is of doubtful clinical significance | 679 (17.9) |
| 2 | Mild, eg, somewhat argumentative, quick to express annoyance | 774 (20.4) |
| 3 | Moderate, eg, often shouts, loses temper | 637 (16.8) |
| 4 | Marked, eg, throws things, breaks windows, occasionally assaultive | 167 (4.4) |
| 5 | Extreme, eg, repeatedly violent against things or persons | 7 (0.2) |

We used the same cutoff score of 3 or greater for the comparison, which corresponds to moderate-to-severe symptomology.

Axis II pathology was assessed using the Structured Interview for DSM-IV Personality Disorders (SIDP-IV) [21]. During the course of the study the protocol changed, and the full SIDP-IV was administered to 2151 patients. All diagnostic raters were psychologists or college graduate research assistants who underwent extensive training as reported elsewhere [19].

The prevalence of subjective anger and overt aggression was determined for each Axis I disorder for which a minimum of 10 patients received a diagnosis. Because sample sizes for some Axis II disorders were small, we evaluated both variables across personality disorder clusters rather than across individual personality disorders.

For both subjective anger and overt aggression, odds ratios and confidence intervals (CIs) were calculated for each diagnostic entity. Because of the high comorbidity rates between various psychiatric disorders, we conducted a multiple regression analysis in which anger and aggression were analyzed as continuous, rather than dichotomous, variables. In doing so, we first determined whether demographic factors, including age, gender, relationship status, race, and education were significantly associated with subjective anger and overt aggression. Demographic variables were entered into a regression analysis that included each of the Axis I disorders found to be significantly associated with anger and aggression in the univariate analyses. In a separate analysis, demographic variables were entered into a regression analysis along with each of the three personality disorder clusters. This analysis included only the 2151 patients who underwent a complete Axis II diagnostic evaluation. Finally, using this same subset of patients, we entered each significantly associated demographic variable, Axis I disorder, and Axis II disorder into a multiple regression analysis to determine their independent contributions. The rationale for analyzing Axis I and Axis II disorders separately at first was to allow comparisons with other studies that may have only analyzed pathology on one axis. (We recognize that DSM-5 no longer distinguishes between Axis I and Axis II, but retain this distinction to be consistent with prior literature.)

### 2.1. Data analysis strategy

In identifying psychiatric disorders associated with a high proportion of clinically significant anger and aggression, SADS item responses were first transformed into dichotomous variables in an odds ratio analysis. Dichotomous variables were used in order to identify diagnostic entities containing significant proportion of patients expressing anger and aggression of clinical significance, rather than characterizing the total levels of anger and aggression amongst the diagnosis.

Diagnoses identified by the odds ratio analysis were entered into the multiple regression analysis. The multiple regression analysis was hierarchical, in which the demographic variables were entered in this first tier, and then diagnoses were entered in the second tier. The variables entered into the multiple regression analyses were continuous, rather than dichotomous, in order to retain the relationship between ordinal levels of anger and aggression and the diagnoses of interest. In making the final determination of which diagnoses were independently associated with elevated anger and aggression, the total distribution of anger and aggression levels was relevant, rather than strictly the proportion of patients carrying each diagnosis in which the levels of anger and aggression were clinically significant.

## 3. Results

### 3.1. Demographic and clinical features

Of the 3800 patients included in the present study, 2272 (59.8%) were female and 1526 (40.2%) were male.

The mean ± SD age of this cohort was 38.8 ± 13.3 years. Most patients were white (90.5%) and had at least a high school diploma (92.1%). Almost half were married or living with someone (47.2%). More than half (57.4%) were diagnosed with an anxiety disorder, 50.9% with a mood disorder, 12.3% with a substance abuse disorder, 11.3% with an impulse control disorder, 9.5% with attention-deficit/hyperactivity disorder, 7.3% with a somatoform disorder, 6.6% with an adjustment disorder, and 3.1% with an eating disorder.

### 3.2. Overall rates of subjective anger and overt aggression

Almost half of the patients presenting to our practice reported at least moderate levels of subjective anger, and nearly 20% endorsed marked or extreme anger (Table 1). Overt aggression was less-commonly reported, with nearly one-quarter endorsing at least moderate levels of aggression and over 40% reporting no aggression during the preceding week.

In comparing rates of subjective anger with levels of depressed mood and psychic anxiety, we found that 50.6% of the sample reported moderate-to-severe levels of depressed mood and 47.6% of the sample reported moderate-to-severe levels of psychic anxiety. Thus, subjective anger, which was rated as moderate-to-severe for 47.2% of the sample, appears to occur with similar frequency.

### 3.3. Predictors of subjective anger

The prevalence of subjective anger and overt expression of anger is presented for each of the Axis I disorders in Table 2 and for the Axis II disorder clusters in Table 3. Subjective anger was elevated across all diagnostic categories except attention-deficit/hyperactivity disorder and adjustment disorder. The highest odds ratios were for IED, PTSD, and MDD. Patients with any personality disorder were 2.9 (CI = 2.3 to 3.6) times more likely to report moderate-to-severe levels of subjective anger. Anger was especially prominent amongst patients diagnosed with a cluster B personality disorder, who were 4.2 (CI = 3.2 to 5.5) times more likely to report moderate-to-severe levels of subjective anger (Table 3).

The demographic variables significantly associated with increased subjective anger were younger age, female gender, non-White and non-Asian racial categories, and lower education. After controlling for demographic characteristics, all disorders significantly associated with increased anger in the univariate analyses remained significant predictors except social phobia, GAD, OCD, specific phobia, and alcohol abuse/dependence (Table 4).

Finally, in the 2151 patients who underwent complete evaluation for all Axis I and II disorders, we performed a multiple regression analysis that included all demographic factors and each diagnosis found to be significantly associated with subjective anger in the previous analyses. MDD, bipolar I disorder, panic disorder with agoraphobia, PTSD, IED, eating disorders, cluster A personality disorders, and cluster B personality disorders made independent contributions to the presence of subjective anger.

Table 2
Rates and odds ratios of subjective anger and overt expression of anger across current Axis I diagnoses in 3800 psychiatric outpatients.

| Patient Group | N | Subjective Anger | Odds Ratio (95% CI) | Overt Expression of Anger | Odds Ratio (95% CI) |
|---|---|---|---|---|---|
| Total sample | 3800 | 19.2 | – | 21.4 | – |
| Mood disorders | | | | | |
| Major depressive disorder | 1598 | 28.8 | 2.9 (2.5 to 3.4) | 27.2 | 1.8 (1.6 to 2.1) |
| Dysthymia | 302 | 19.2 | 1.0 (0.7 to 1.3) | 18.5 | 0.8 (0.6 to 1.1) |
| Bipolar I, depressed | 53 | 34.0 | 2.2 (1.2 to 3.9) | 34.0 | 1.9 (1.1 to 3.4) |
| Bipolar II, depressed | 95 | 28.4 | 1.7 (1.1 to 2.7) | 31.6 | 1.7 (1.1 to 2.7) |
| Any depressive disorder | 1889 | 27.7 | 3.2 (2.7 to 3.8) | 26.6 | 1.9 (1.6 to 2.2) |
| Anxiety disorders | | | | | |
| Panic disorder with agoraphobia | 484 | 29.8 | 2.0 (1.6 to 2.4) | 33.1 | 2.0 (1.6 to 2.5) |
| Panic disorder without agoraphobia | 176 | 25.0 | 1.4 (1.0 to 2.0) | 22.2 | 1.1 (0.7 to 1.5) |
| Social phobia | 1077 | 24.0 | 1.5 (1.3 to 1.8) | 25.3 | 1.4 (1.2 to 1.6) |
| PTSD | 417 | 37.6 | 3.0 (2.4 to 3.7) | 38.4 | 2.6 (2.1 to 3.2) |
| GAD | 819 | 22.6 | 1.3 (1.1 to 1.6) | 27.6 | 1.6 (1.3 to 1.9) |
| OCD | 265 | 26.8 | 1.6 (1.2 to 2.1) | 26.8 | 1.4 (1.0 to 1.8) |
| Specific phobia | 434 | 27.6 | 1.7 (1.4 to 2.2) | 33.4 | 2.0 (1.6 to 2.5) |
| Any anxiety disorder | 2182 | 23.4 | 2.0 (1.6 to 2.3) | 25.7 | 1.9 (1.6 to 2.2) |
| Any adjustment disorder | 251 | 13.1 | 0.6 (0.4 to 0.9) | 12.4 | 0.5 (0.3 to 0.7) |
| Substance abuse/dependence | | | | | |
| Alcohol | 333 | 22.5 | 1.2 (1.0 to 1.6) | 23.4 | 1.1 (0.9 to 1.5) |
| Drug | 206 | 28.2 | 1.7 (1.2 to 2.3) | 34.0 | 2.0 (1.5 to 2.7) |
| Any Substance | 468 | 24.4 | 1.4 (1.1 to 1.8) | 27.1 | 1.4 (1.2 to 1.8) |
| IED | 136 | 44.1 | 3.5 (2.5 to 5.0) | 66.9 | 8.3 (5.7 to 12.0) |
| Impulse-control disorder | 310 | 28.4 | 1.8 (1.4 to 2.3) | 35.8 | 2.2 (1.7 to 2.8) |
| Eating disorder | 117 | 35.0 | 2.3 (1.6 to 3.5) | 34.2 | 2.0 (1.3 to 2.9) |
| Somatoform disorder | 276 | 28.3 | 1.7 (1.3 to 2.3) | 29.3 | 1.6 (1.2 to 2.1) |
| Attention-deficit/hyperactivity disorder | 361 | 17.2 | 0.9 (0.6 to 1.1) | 27.7 | 1.5 (1.2 to 1.9) |

Table 3
Rates and odds ratios of subjective anger and overt expression of anger across current personality disorder clusters in 2151 psychiatric outpatients.

| Patient Group | N | Subjective Anger | Odds Ratio (95% CI) | Overt Expression of Anger | Odds Ratio (95% CI) |
|---|---|---|---|---|---|
| Total sample | 2151 | 19.1 | – | 23.1 | – |
| Cluster A | 92 | 43.5 | 3.5 (2.3, 5.4) | 40.2 | 2.3 (1.5, 3.6) |
| Cluster B | 259 | 43.6 | 4.2 (3.2, 5.5) | 50.6 | 4.3 (3.3, 5.6) |
| Cluster C | 413 | 29.1 | 2.0 (1.6, 2.6) | 31.5 | 1.7 (1.4, 2.2) |
| Any personality disorder | 615 | 31.9 | 2.9 (2.3, 3.6) | 35.8 | 2.5 (2.1, 3.1) |

Table 4
Hierarchical regression analyses predicting subjective anger across Axis I disorders, Axis II disorders, and both Axis I and II disorders.

| Variable | β | t | p |
|---|---|---|---|
| Across Axis I disorders | | | |
| Age | −0.05 | −3.01 | 0.003 |
| Gender | −0.03 | −2.03 | 0.04 |
| Relationship status | 0.03 | −1.09 | 0.28 |
| Race | −0.02 | 2.20 | 0.03 |
| Education | −0.06 | −3.98 | <0.001 |
| Major depressive disorder | 0.19 | 11.35 | <0.001 |
| Bipolar I, depressed | 0.05 | 3.12 | 0.002 |
| Bipolar II, depressed | 0.05 | 3.13 | 0.002 |
| Panic disorder with agoraphobia | 0.04 | 2.46 | 0.01 |
| Panic disorder without agoraphobia | 0.02 | 1.05 | 0.29 |
| Social phobia | 0.01 | 0.48 | 0.63 |
| PTSD | 0.09 | 5.82 | <0.001 |
| GAD | 0.01 | 0.52 | 0.60 |
| OCD | 0.01 | 0.89 | 0.37 |
| Specific phobia | 0.03 | 1.66 | 0.10 |
| Alcohol abuse or dependence | 0.02 | 0.96 | 0.34 |
| Drug abuse or dependence | 0.04 | 2.77 | 0.006 |
| IED | 0.11 | 6.89 | <0.001 |
| Impulse control disorders (other than IED) | 0.03 | 2.06 | 0.04 |
| Eating disorders | 0.05 | 3.14 | 0.002 |
| Somatoform disorders | 0.03 | 2.19 | 0.03 |
| Across Axis II disorders | | | |
| Age | −0.03 | −1.45 | 0.15 |
| Gender | −0.07 | −3.30 | 0.001 |
| Relationship status | −0.06 | −3.47 | 0.01 |
| Race | 0.03 | 1.19 | 0.23 |
| Education | −0.09 | −4.95 | <0.001 |
| Cluster A personality disorder | 0.08 | 3.86 | <0.001 |
| Cluster B personality disorder | 0.20 | 9.11 | <0.001 |
| Cluster C personality disorder | 0.09 | 4.12 | <0.001 |
| Across Axis I and II disorders | | | |
| Age | −0.03 | −1.50 | 0.14 |
| Gender | −0.05 | −2.51 | 0.01 |
| Relationship status | −0.05 | −2.10 | 0.04 |
| Race | 0.02 | 0.97 | 0.33 |
| Education | −0.06 | −3.10 | 0.002 |
| Major depressive disorder | 0.16 | 7.56 | <0.001 |
| Bipolar I, depressed | 0.07 | 3.38 | 0.001 |
| Bipolar II, depressed | 0.03 | 1.42 | 0.16 |
| Panic disorder with agoraphobia | 0.04 | 2.04 | 0.04 |
| PTSD | 0.05 | 2.48 | 0.01 |
| Drug abuse or dependence | 0.02 | 1.17 | 0.24 |
| IED | 0.13 | 6.13 | <0.001 |
| Impulse control disorders (other than IED) | 0.03 | 1.64 | 0.10 |
| Eating disorders | 0.04 | 2.16 | 0.03 |
| Somatoform disorders | 0.02 | 0.76 | 0.45 |
| Cluster A personality disorder | 0.06 | 2.96 | 0.003 |
| Cluster B personality disorder | 0.16 | 7.56 | <0.001 |
| Cluster C personality disorder | 0.04 | 1.93 | 0.05 |

### 3.4. Predictors of overt aggression

In univariate analyses, each of the Axis I disorders associated with subjective anger was also found to be associated with overt expression of anger, with the exceptions of panic disorder and alcohol abuse/dependence. Furthermore, attention-deficit/hyperactivity disorder was found to be associated with aggression but not subjective anger. Odds ratios indicated that IED, PTSD, and impulse control disorders other than IED were most likely to be associated with current aggression (Table 2). Patients with any personality disorder were 2.5 (CI = 2.1 to 3.1) times more likely to report moderate-to-severe levels of overt aggression. Like anger, aggression was especially prominent amongst patients diagnosed with a cluster B personality disorder, who were 4.3 (CI = 3.3 to 5.6) times more likely to report moderate-to-severe levels of overt aggression.

We performed the same series of multiple regression analyses to determine which Axis I and II disorders were associated with aggressive behavior (Table 5). In the analysis of Axis I disorders, younger age, female gender, widowed or divorced relationship status, and lower education were associated with increased aggression. After controlling for demographic characteristics, all disorders significantly associated with increased aggression in the univariate analyses remained significant predictors except social phobia, OCD, somatoform disorders, and cluster A personality disorders.

On entering demographic factors and the Axis I and II disorders found to be significantly associated with aggression in the previous analyses into the regression equation, we found that MDD, panic disorder with agoraphobia, PTSD, GAD, IED, impulse control disorders other than IED, and cluster B personality disorders all independently predicted overt aggression.

## 4. Discussion

Our results confirm and extend the previous findings from the MIDAS project [1]. We found once again that clinically significant anger had a prevalence comparable to that of depressed mood and psychic anxiety in the patient population, and many of the same diagnoses were independently associated with subjective anger and overt aggression. MDD, bipolar I disorder, PTSD, IED, and cluster B personality disorders were again found to be predictors of

Table 5
Hierarchical regression analyses predicting aggressive behavior across Axis I disorders, Axis II disorders, and both Axis I and II disorders.

| Variable | β | t | p |
|---|---|---|---|
| Across Axis I disorders | | | |
| Age | −0.12 | −7.15 | <0.001 |
| Gender | −0.04 | −2.53 | 0.01 |
| Relationship status | −0.08 | −4.86 | <0.001 |
| Race | 0.01 | 0.73 | 0.47 |
| Education | −0.08 | −5.04 | <0.001 |
| Major depressive disorder | 0.10 | 6.17 | <0.001 |
| Bipolar I, depressed | 0.03 | 2.00 | 0.046 |
| Bipolar II, depressed | 0.04 | 2.43 | 0.02 |
| Panic disorder with agoraphobia | 0.05 | 3.28 | 0.001 |
| Social phobia | −0.01 | −0.68 | 0.50 |
| PTSD | 0.09 | 5.43 | <0.001 |
| GAD | 0.04 | 2.68 | 0.007 |
| OCD | −0.01 | −0.51 | 0.61 |
| Specific phobia | 0.05 | 3.33 | 0.001 |
| Drug abuse or dependence | 0.06 | 3.53 | <0.001 |
| IED | 0.19 | 12.50 | <0.001 |
| Impulse control disorders (other than IED) | 0.07 | 4.50 | <0.001 |
| Eating disorders | 0.03 | 2.20 | 0.03 |
| Somatoform disorders | 0.03 | 1.70 | 0.09 |
| Attention deficit/hyperactivity disorder | 0.03 | 2.06 | 0.04 |
| Across Axis II disorders | | | |
| Age | −0.12 | −5.43 | <0.001 |
| Gender | −0.07 | −3.28 | 0.001 |
| Relationship status | −0.14 | −6.21 | <0.001 |
| Race | 0.04 | 1.73 | 0.08 |
| Education | −0.10 | −4.67 | <0.001 |
| Cluster A personality disorder | 0.04 | 1.85 | 0.07 |
| Cluster B personality disorder | 0.21 | 9.93 | <0.001 |
| Cluster C personality disorder | 0.07 | 3.21 | 0.001 |
| Across Axis I and II disorders | | | |
| Age | −0.11 | −5.06 | <0.001 |
| Gender | −0.06 | −3.11 | 0.002 |
| Relationship status | −0.13 | −5.99 | <0.001 |
| Race | 0.03 | 1.58 | 0.12 |
| Education | −0.06 | −2.72 | 0.01 |
| Major depressive disorder | 0.09 | 4.12 | <0.001 |
| Bipolar I, depressed | 0.04 | 1.82 | 0.07 |
| Bipolar II, depressed | −0.01 | −0.60 | 0.55 |
| Panic disorder with agoraphobia | 0.06 | 3.11 | 0.002 |
| PTSD | 0.06 | 2.98 | 0.003 |
| GAD | 0.06 | 3.03 | 0.002 |
| Specific phobia | 0.02 | 0.73 | 0.47 |
| Drug abuse or dependence | 0.02 | 0.87 | 0.39 |
| IED | 0.21 | 10.43 | <0.001 |
| Impulse control disorders (other than IED) | 0.05 | 2.64 | 0.008 |
| Eating disorders | 0.04 | 1.96 | 0.05 |
| Attention deficit/hyperactivity disorder | 0.03 | 1.28 | 0.20 |
| Cluster B personality disorder | 0.19 | 8.98 | <0.001 |
| Cluster C personality disorder | 0.03 | 1.31 | 0.20 |

subjective anger, and MDD, GAD, IED, and cluster B personality disorders were again found to be predictors of aggression. Panic disorder with agoraphobia, eating disorders, and cluster A personality disorders were significantly associated with anger in the present analysis but not in the prior analysis, while specific phobia was no longer associated with anger in the current analysis. Furthermore, panic disorder with agoraphobia, PTSD, and impulse control disorders other than IED were significantly associated with aggression in the present analysis but not in the prior analysis, while bipolar I disorder and drug abuse or dependence were no longer associated with aggression in the current analysis.

In the final analysis, female gender, widowed or divorced relationship status, and lower educational level, but neither age not race, independently contributed to increased subjective anger. The same demographic factors, in addition to age, independently contributed to increased levels of overt aggression. The finding that race contributed to neither anger nor aggression is in accordance with findings of no difference in anger between Blacks and Whites [22], but contradicts findings from the Midlife in the United States (MIDUS) National Sample that Blacks expressed higher aggression than Whites [15]. This disagreement may be explained by the fact that the current study examines a psychiatric population, whereas the MIDUS results are derived from a non-psychiatric population. Relationship status and educational level may be associated with anger and aggression due to their roles in establishing support systems in the home and community. Furthermore, the finding that females endorsed higher levels of anger and aggression than males was discordant the initial hypothesis that males would endorse greater severity of these disturbances. It is suspected that this result occurred due to the study of a clinical study sample in which patients endorsed a particularly large rate of depressive and anxiety disorders, rather than an epidemiological sample. The literature on the relationship between anger and gender has not been entirely consistent; while many studies found greater anger in males than females [1,23], others have found the opposite [4] or no significant association at all [24].

As in the prior analysis [1], psychiatric disorders for which anger or aggression is a diagnostic criterion, i.e. bipolar disorder, GAD, PTSD, IED, and cluster B personality disorders, were found to be associated with higher rates of anger or aggression. Unexpectedly, bipolar 1 disorder was not significant ($p = 0.07$) in predicting aggression in the current analysis, whereas the association was significant in the prior analysis.

MDD was again strongly associated with both anger and aggression, confirming the need for clinicians to be concerned with symptoms of anger and aggression even if the chief complaint is not immediately related to these disturbances. Furthermore, the positive finding of increased anger and aggression in this large cohort of patients, half of whom were diagnosed with MDD, warrants investigation into hostile depression as a subtype of depression similar to anxious depression, consistent with the work of Paykel [25] and Fava and colleagues [26–29].

Anger and aggression were shown to appear with similar frequency to depressed mood and psychic anxiety in the study population, suggesting similar clinical relevance. However, the literature continues to show greater neglect of anger and aggression in comparison to these other

affective states. While PubMed searches for the terms "depression" and "anxiety" yield 198,297 and 114,924 results, respectively, for the past 15 years (beginning January 1, 2001), a search for "anger OR irritability OR hostility OR aggression" yields only 37,825 results. In the fifteen years prior (1986–2001), the same three searches yield 83,330, 38,662, and 15,586 results, respectively. These findings indicate a consistent, relative neglect of anger and aggression in the literature. Presently, there are no approved pharmacologic interventions for anger or aggression, and the results of the current study support the potential importance of such interventions to the extent that pharmacologic interventions for depression and anxiety are important. Currently, the Unified Protocol (UP) developed by Barlow and colleagues [30] is an important psychosocial intervention used for the transdiagnostic treatment of anger in the context of other psychiatric disorders. Pharmacological interventions for anger and aggression could benefit patients as either an alternative to or adjunct to psychosocial interventions such as the UP.

As a single-site study, the present study is limited in its generalizability as non-White, uneducated, psychotic, and substance-abusing patients were all underrepresented in the study population. On the other hand, the study site did not select for specific diagnoses, and patients at the study site are less likely to present prototypically for their diagnoses than they would at specialized treatment centers.

Another limitation of the current study is the use of single-item measures of anger and aggression, which are generally less reliable and valid than multi-item measures. While the current study has identified several diagnoses associated with elevated levels of anger and aggression, further study in the field should use multi-item measures such as the Anger Disorders Scale or the State–Trait Anger Scale [31].

It was hypothesized that the inclusion of additional demographic variables may have confounded a comparison between the present study and the prior analysis, so the analyses were repeated without inclusion of the three additional demographic variables — relationship status, race, and education. This series of analyses yielded results identical to those including the additional demographic variables (results omitted), suggesting that the inclusion of these variables did not account for any divergence from the results of the prior study.

### 4.1. Conclusions

The results of the present analysis largely confirm Posternak and Zimmerman's conclusion that anger and aggression are fairly common in psychiatric outpatients, particularly those diagnosed with MDD, IED, and cluster B personality disorders [1]. Furthermore, anger and aggression were clinically relevant across all diagnostic categories except adjustment disorders. Anger and aggression are of great relevance to the treating clinician, who should be particularly mindful of anger and aggression in patients with the aforementioned demographic and diagnostic features. Given their great clinical significance, the responsiveness of anger and aggression in the treatment of a variety of psychiatric disorders should be considered a gap in the current literature.

## References

[1] Posternak MA, Zimmerman M. Anger and aggression in psychiatric outpatients. J Clin Psychiatry 2002;63(8):665-72.
[2] Judd LL, Schettler PJ, Coryell W, Akiskal HS, Fiedorowicz JG. Overt irritability/anger in unipolar major depressive episodes past and current characteristics and implications for long-term course. JAMA Psychiat 2013;70(11):1171-80.
[3] Koh KB, Kim CH, Park JK. Predominance of anger in depressive disorders compared with anxiety disorders and somatoform disorders. J Clin Psychiatry 2002;63:486-92.
[4] Barrett EL, Mills KL, Tesson M. Mental health correlates of anger in the general population: findings from the 2007 National Survey of Mental Health and Wellbeing. Aust N Z J Psychiatry 2013; 47:470-6.
[5] Perroud N, Baud P, Mouthon D, Courtet P, Malafosse A. Impulsivity, aggression and suicidal behavior in unipolar and bipolar disorders. J Affect Disord 2011;134:112-8.
[6] Corrigan PW, Watson AC. Findings from the National Comorbidity Survey on the frequency of violent behavior in individuals with psychiatric disorders. Psychiatry Res 2005;136:153-62.
[7] Fazel S, Lichtenstein P, Grann M, Goodwin GM, Langstrom N. Bipolar disorder and violent crime: new evidence from population-based longitudinal studies and systematic review. Arch Gen Psychiatry 2010;67:931-8.
[8] Ballester J, Goldstein T, Goldstein B, Obreja M, Axelson D, Monk K, et al. Is bipolar disorder specifically associated with aggression? Bipolar Disord 2012;14(3):283-90.
[9] Pulay AJ, Dawson DA, Hasin DS, Goldstein RB, Ruan WJ, Pickering RP, et al. Violent behavior and DSM-IV psychiatric disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions. J Clin Psychiatry 2008;69:12-22.
[10] Deschênes SS, Dugas MJ, Fracalanza K, Koerner N. The role of anger in generalized anxiety disorder. Cog Behav Ther 2002;41: 261-71.
[11] Hawkins KA, Cougle JR. Anger problems across the anxiety disorders: findings from a population-based study. Depress Anxiety 2011;28: 145-52.
[12] Moscovitch DA, McCabe RE, Antony MM, Rocca L, Winson RP. Anger experience and expression across the anxiety disorders. Depress Anxiety 2008;25:107-13.
[13] Coid J, Yang M, Roberts A, Ullrich S, Moran P, Bebbington P, et al. Violence and psychiatric morbidity in a national household population—a report from the British household survey. Am J Epidemiol 2006;164:1199-208.
[14] Cassiello-Robins C, Barlow DH. Anger: the unrecognized emotion in emotional disorders. Clin Psychol Sci Pract 2016;23:66-85.
[15] Morozink Boylan J, Lewis TT, Coe CL, Ryff CD. Education status, anger, and inflammation in the MIDUS national sample: does race matter? Ann Behav Med 2015;49:570-8.
[16] Ross CE, Van Willigen M. Education and the subjective quality of life. J Health Soc Behav 1997;38:275-97.
[17] Kucharska-Newton AM, Williams JE, Chang PP, Stearns SC, Sueta CA, Blecker SB, et al. Anger proneness, gender, and the risk of heart failure. J Card Fail 2012;20:1020-6.
[18] First MB, Spitzer RL, Williams JBW, Gibbon M. Structured clinical interview for DSM-IV (SCID). Washington, DC: American Psychiatric Association; 1997.
[19] Zimmerman M, Mattia JI. Psychiatric diagnosis in clinical practice: is comorbidity being missed? Compr Psychiatry 1990;40:182-91.

[20] Endicott J, Spitzer RL. A diagnostic interview: the schedule for affective disorders and schizophrenia. Arch Gen Psychiatry 1978;35: 837-44.
[21] Pfohl B, Blum N, Zimmerman M. Structured interview for DSM-IV personality disorders. Washington DC: American Psychiatric Press; 1997.
[22] Mabry JB, Kiecolt KJ. Anger in black and white: race, alienation, and anger. J Health Soc Behav 2005;46:85-101.
[23] Ewigman NL, Gylys JA, Harman JS. The diagnosis of anger as a presenting complaint in outpatient medical settings. Psychiatr Serv 2013;64(9):921-4.
[24] Archer J. Sex differences in aggression in real-world settings: a meta-analytic review. Rev Gen Psychol 2004;8(4):291-322.
[25] Paykel ES. The classification of depression. Br J Clin Pharmacol 1983; 15(Suppl 2):155S-9S.
[26] Fava GA, Kellner R, Munari F, Pavan L, Pesarin F. Losses, hostility, and depression. J Nerv Ment Dis 1982;170(8):474-8.
[27] Fava M, Anderson K, Rosenbaum JF. "Anger attacks": possible variants of panic and major depressive disorders. Am J Psychiatry 1990;147(7):867-70.
[28] Fava M, Rosenbaum JF, Pava JA, McCarthy MK, Steingard RJ, Bouffides E. Anger attacks in unipolar depression, part 1: clinical correlates and response to fluoxetine treatment. Am J Psyhciatry 1993; 150(8):1158-63.
[29] Fava M, Rosenbaum JF. Anger attacks in patients with depression. J Clin Psychiatry 1999;60(Suppl 15):21-4.
[30] Barlow DH, Farchione TJ, Fairholme CF, Ellard KK, Boisseau CL, Allen LB, et al. The unified protocol for the transdiagnostic treatment of emotional disorders. New York, NY: Oxford University Press; 2011.
[31] Spielberger CD. STAXI-2: the state–trait anger expression inventory. Odessa, FL: Psychological Assessment Resources; 1998.