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Examining the Association Between Psychotropic Medication and Suicidal Desire and Risk

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EXAMINING THE ASSOCIATION BETWEEN PSYCHOTROPIC MEDICATION USAGE AND SUICIDAL DESIRE AND RISK

by

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ABSTRACT

EXAMINING THE ASSOCIATION BETWEEN PSYCOTROPIC MEDICATION USAGE AND SUICIDAL DESIRE AND RISK

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The primary aim of this study was to examine the relationship between components of suicidal desire and psychotropic medication. Specifically, the usage of psychotropic medication, the usage of specific classes of psychotropic medications and the amount of psychotropic medication utilized, and differences in feelings of perceived burdensomeness, thwarted belongingness, and overall suicide risk were examined. The present study utilized pre-collected data consisting of 225 patients with substance use disorder, who are undergoing residential treatment for substance dependence. It was posited that individuals utilizing psychotropic medications would exhibit higher mean levels of thwarted belongingness, perceived burdensomeness, and suicide risk relative to individuals not utilizing psychotropics and that individuals utilizing multiple psychotropic medications would exhibit higher suicidal desire and risk than individuals utilizing zero or one psychotropic medication. Additionally, it was posited that individuals utilizing antipsychotics would exhibit higher suicidal desire and risk than individuals utilizing any other type of psychotropic medication. For all hypotheses, it was posited that such effects would occur above and beyond severity of psychopathology and substance use. Results indicated a significant difference in suicide risk between individuals utilizing a psychotropic and individuals not utilizing a psychotropic. Additional exploratory analyses indicated a significant difference in levels of perceived

burdensomeness between individuals utilizing an antidepressant and individuals utilizing any other type of psychotropic besides an antidepressant. Overall, results suggest that the use of psychotropic medication may increase the risk for suicide. These findings highlight the need for routine suicide risk assessments for patients utilizing psychotropic medications.

DEDICATION

This work is dedicated to my parents and fiancé. Thank you for all of your support and encouragement throughout the years.

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LIST OF ABBREVIATIONS

ANCOVA	Analysis of Covariance
ANOVA	Analysis of Variance
BEST	Borderline Evaluation of Severity Over Time
BPD	Borderline Personality Disorder
DASS	Depression, Anxiety, Stress Scale
DUQ	Drug Use Questionnaire
INQ	Interpersonal Needs Questionnaire
IPTS	Interpersonal Psychological Theory of Suicide
MINI	Mini-International Neuropsychiatric Interview
MMSE	Mini-Mental Status Exam
PB	Perceived Burdensomeness
PTSD	Posttraumatic Stress Disorder
SCID-I/P	Structured Clinical Interview for DSM-IV Axis I Disorders
SUD	Substance Use Disorders
TB	Thwarted Belongingness

CHAPTER I

INTRODUCTION

Suicide is a significant public health concern in the U.S., serving as the tenth leading cause of death in 2013 (Centers for Disease Control and Prevention [CDC], 2015). A systematic review examining 15,629 cases of suicide in the general population between 1959 and 2001 suggested that 98% of individuals who died by suicide had a diagnosable mental disorder (Bertolote & Fleischmann, 2002). Indeed, mental illness is a known risk factor for suicide, and suicidality is often treated through interventions aimed at addressing specific mental disorders.

One approach to intervention commonly utilized for treating suicidal individuals is psychopharmacology, which can include numerous classes of drugs targeting a wide range of mental disorders; however, the evidence regarding the suicide prevention capabilities of psychotropic medications is mixed (Ernst & Goldberg, 2004). For example, Rissanen et al. (2012) found that individuals taking antipsychotics for longer periods of time exhibited more suicidal ideation relative to individuals taking antipsychotics for shorter periods of time, even after accounting for symptoms of depression and anxiety. Additionally, accounting for other psychiatric symptoms, the dosage of antipsychotic medication was significantly associated with suicidal ideation among individuals with non-psychotic diagnoses, such that higher doses were correlated with more suicidal ideation. No consistent mechanism has been proposed for the studies mentioned above, further underscoring the inconsistency in the evidence for suicide-related outcomes with respect to pharmacological treatment.

In addition to their association with suicidal ideation, psychotropics also potentially play a role in suicidal behavior. Succeeding unspecified and medicinal substances, psychotropic medications are the most common agent utilized for intentional overdoses, which is the most common method of suicide attempt and self-inflicted injury among individuals requiring an Emergency Department visit as a result of such incidents (Ting, Sullivan, Boudreaux, Miller, & Camargo, 2012). In 2011, benzodiazepines, antidepressants, and antipsychotics were utilized in approximately 62% of suicide attempts (Substance Abuse and Mental Health Services Administration, 2013). Indeed, many psychotropic medications are labeled with a black box warning indicating potential risk of suicidal ideation or behavior for consumers (e.g. antidepressants, antiepileptics, Atomoxetine; Hassan, 2012). Although prior studies have established the existence of a relationship between psychotropic medication and suicidality, research examining the nature of such a relationship is lacking; thus, empirical research investigating mechanisms and relevant contextual factors of psychotropic medication use associated with suicidality is essential for prevention of problematic outcomes and mitigation of consequences.

One theoretical framework that may provide a method for understanding the nature of the relationship between psychotropic medications and suicidality is the interpersonal-psychological theory of suicidal behavior (IPTS; Joiner, 2005). The theory posits that, in addition to the ability to die by suicide, an individual must possess a desire for suicide in order to enact lethal self-harm. This desire for suicide is comprised of the simultaneous presence of two psychological states: perceived burdensomeness (PB) and thwarted belongingness (TB). PB is an individual's sense that he/she is a burden and

liability to family, friends, and/or society and the belief that one's death is worth more to others than their continued life. TB is an individual's sense that he/she lacks meaningful connections with others.

As suggested by Van Orden et al.'s (2010) hierarchical latent variable model, PB is comprised of a belief of liability and cognitions of self-hatred. In this model, factors such as low self-esteem, shame, and unemployment result in feelings of PB. The hierarchical latent variable model also suggests that TB is comprised of both loneliness and the absence of reciprocally caring relationships. In this model, factors such as low social support, living alone, divorce, and social withdrawal result in feelings of TB. A longitudinal study examining factors associated with psychotropic medication use at three time points within 17 years found that non-clinical characteristics predicted psychotropic medication use (Colman, Croudace, Wadsworth, & Jones, 2008). Specifically, unemployment and lack of social support were associated with the use of antidepressants, anxiolytics, and hypnotics above and beyond the effects of the severity of psychopathology. Unemployment significantly predicted psychotropic medication use at both time 1 and time 3; whereas, living alone, divorce and separation significantly predicted psychotropic medication use at time 3.

Although several psychotropic medications are efficacious in the reduction of symptoms associated with particular psychopathological disorders, the use of these medications is often accompanied by adverse side effects (Murray, 2006; Ponterotto, 1985). Neurological disorders, confusion and disorientation, hallucinations, anxiety, depression, irritability, hostility, and anger have been associated with the use of benzodiazepines (Maxmen & Ward, 1995). Antidepressants, specifically Selective

Serotonin Reuptake Inhibitors, have been reported to induce extrapyramidal symptoms such as akathaisia, dystonia, parkinsonism, and tardive dyskinesia (Leo, 1996). Increasing incidence of tardive dyskinesia was found to be associated with antipsychotic use over time (Glazer, 2000). In a clinical sample of 362 adults, tardive dyskinesia was experienced by approximately 32% of individuals using antipsychotics for 5 years or less, 57% using antipsychotics for 10 to 15 years, and 68% with 20 to 25 years of use. In a study examining the regional brain activity of participants performing cognitive tasks succeeding treatment with mood stabilizers, results indicated that lithium and valproate caused cognitive impairments in individuals with no previous consumption of mood stabilizers (Bell, Willson, William, Dave, & Silverstone, 2005).

Psychopharmacotherapy is often negatively stereotyped by individuals whom are unfamiliar with psychotropics, as one study found that individuals who had never utilized a psychotropic medication displayed significantly more negative attitudes towards and beliefs about psychotropic medication than either psychiatric or substance abuse outpatients (Fife, Ketzenberger, & Olson, 2012). Similarly, upon examination of public opinions and beliefs regarding treatment of depression, Ozmen and colleagues (2005) found that the public considered pharmacotherapy an ineffective treatment for depression. Furthermore, among the 213 participants, 62.1% believed that antidepressant treatment may result in addiction.

In concordance with the negative view, stigmatization is often associated with psychopharmacology. A study investigating stigmatization among adolescents utilizing psychiatric medication discovered thematic constructs that commonly emerged among such adolescents (Kranke, Floersch, Townsend, & Munson, 2009). Adolescents taking

antipsychotic medication often felt a sense of shame associated with taking medication. Furthermore, adolescents perceiving non-acceptance from peers resulting from medication usage withdrew from peer interactions. Additionally, a study examining patients' personal experiences in regards to medication-induced stigmas discovered that patients with schizophrenia receiving medication treatment felt most stigmatized in areas of employment due to side effects of medication (e.g. others perceive work performance as being impaired; Novak & Švab, 2009). Examining the perception of stigma among outpatients receiving antidepressants, Interian, Martinez, Guarnaccia, Vega, and Escobar (2007) found that the use of antidepressants was associated with negative attributes such as weakness and inability to cope with problems.

The primary aim of the study is to investigate the association between psychotropic medication usage and suicidal desire and risk in a sample of adults receiving residential treatment for substance use disorders. Given the adverse side effects of psychotropic medications and the stigmatizing effects associated with their usage, we hypothesize that individuals utilizing psychotropic medications will exhibit higher mean levels of PB, TB and suicide risk relative to individuals not utilizing psychotropics, above and beyond the effects of the severity of psychopathology. Additionally, we posit that individuals utilizing multiple psychotropic medications will exhibit higher mean levels of PB, TB and suicide risk in contrast to individuals utilizing one or zero psychotropic medication, again controlling for severity of psychopathology. Finally, we hypothesize that individuals utilizing antipsychotics will exhibit higher mean levels of PB, TB, and suicide risk than individuals utilizing psychotropic medications from any other classification (i.e. antidepressants, anxiolytics, or mood stabilizers). Here again, we will

control for severity of psychopathology. Effective mental health treatment for psychological disorders such as depressive, bipolar spectrum, and schizophrenic disorders often involves pharmacological therapy (e.g. Baghai et al., 2011; Culver, Arnow, & Ketter, 2007; Marder, 2000), and results consistent with hypotheses would suggest that individuals prescribed such medications may experience elevated levels of suicidal desire and risk; therefore, suggesting the need for routine suicide risk assessment in such individuals. The proposed study does not intend to advocate against the use of psychopharmacology, but rather suggests closer monitoring of individuals utilizing psychotropic medication. Although not all individuals utilizing such medication experience an increased risk for suicide, some individuals may experience increases in certain elements of risk. Understanding the nature of the relationship between psychotropic medication and suicidality may allow for the reduction of risks in such individuals.

CHAPTER II

METHOD

Participants

Participants included 225 patients with substance dependence (50.2% male) undergoing treatment in a residential Substance Use Disorder (SUD) treatment facility. Participants ranged in age from 18 to 65 years (M_{age} = 34.36). Regarding participant ethnicity: 59.6% identified as White, 36.4% as African American, 1.3% as Hispanic/Latino, and 1.3% identified as another racial/ethnic background. Regarding participants' educational attainment: 27.1% had not completed high school or received a GED, 33.7% received a high school diploma or GED, and 8.8% graduated from college. Demographic information is included in Table 1. Inclusion criteria for the current study consisted of information pertaining to the use of a psychotropic medication (presence versus absence) and, for those who endorsed currently taking psychotropic medications, the name of the psychotropic medication(s) being utilized. Approximately half of the participants (n =112) were utilizing some form of prescribed psychotropic medication: 36% utilized an antidepressant, 11% utilized an anxiolytic, 11% utilized a mood stabilizer, and 10% utilized an antipsychotic. Additionally, 32.4% utilized medication from a single class of psychotropics, 13.8% utilized medication from two classes of psychotropic medication, and 2.7% utilized medication from three classes of psychotropic medication (see Table 2). Risk for suicide was diverse within this sample, with majority of the sample (58.7%) endorsing at least a low risk for suicide and 38.7% endorsing no risk for suicide.

Table 1

Demographic Information

Race	N = 222	Relationship Status	N = 221
White/Caucasian	59.6	Single	60.0
Black/African American	36.4	Living with a partner	12.4
Asian/Southeast Asian	0.4	Married but separated	10.7
Hispanic/Latino	1.3	Married	15.1
Native American	0.9		
Education	**N = 221**	**Income**	**N = 218**
Less than High School	27.5	0 - 19,999	65.3
High School Graduate/G.E.D.	33.7	20,000 - 39,999	14.7
Some College	22.7	40,000 - 59,999	7.6
College Graduate	6.2	60,000 - 79,999	4.0
Some Graduate School	1.3	80,000 - 99,999	1.7
Graduate or Professional Degree	1.3	100,000 or more	3.6

Table 2

Psychotropic Medication Information

Variable	Percentage (N = 225)
Number of Psychotropic Medications	
0	51.1
1	29.8
2	14.2
3	4.0
4	0.4
5	0.4
Number of Psychotropic Classes	
0	51.1
1	32.4
2	13.8
3	2.7
Class of Psychotropic Medication Used	
Antidepressant	36.0
Antipsychotic	10.2

Table 2 (continued).

Variable	Percentage (N= 225)
Anxiolytic	11.1
Mood Stabilizer	10.7

Table 3

Diagnostic Information

DSM-IV Diagnosis	Percent of Individuals with Diagnosis
Generalized Anxiety Disorder	32.0
Panic Disorder without Agoraphobia	24.9
Posttraumatic Stress Disorder	24.9
Social Phobia	23.1
Antisocial Personality Disorder	38.7
Borderline Personality Disorder	33.3
Obsessive-Compulsive Personality Disorder	12.4
Anorexia Nervosa	0.4
Bulimia Nervosa	7.6
Major Depressive Episode	25.8

Measures

Diagnostic and Clinical Interviews

Substance Use Disorders. The Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV), Axis I Disorders (SCID-I/P; First, Spitzer, Gibbon & Williams, 1996) is a structured diagnostic interview assessing both current and lifetime DSM-IV Axis I disorders. In the current study, the SCID-I/P was used to assess SUDs. The SCID-I/P has demonstrated adequate inter-rater and test-retest reliability (Lobbestael, Leurgans, & Arntz, 2011). Diagnostic frequencies are included in Table 3.

Axis I Disorders. The Mini International Neuropsychiatric Interview, Version 6.0 (MINI; Sheehan et al., 2009) is a short structured diagnostic interview assessing current

DSM-IV Axis I disorders. In the current study, the MINI was used to assess DSM-IV Axis I disorders, with the exclusion of posttraumatic stress disorder (PTSD) and SUDs. The MINI has demonstrated adequate reliability and validity in its assessment of psychiatric disorders, as well as strong test-retest and inter-rater reliability (Sheehan et al., 1997).

Predictors

Psychotropic Medication Usage. Participants were asked, "Are you currently taking any medications for a psychiatric disorder?" Answers were structured as yes versus no. Responses were coded as 0 if participants did not endorse the use of a psychotropic medication, and as 1 if participants endorsed the use of a psychotropic medication.

Number of Psychotropic Medications. Participants who endorsed the use of psychotropic medications were asked to provide the names of the psychotropic medications currently being used. Researchers verified if the medication name provided was actually a psychotropic, and responses were coded on the basis of the number of psychotropic medication names provided. Responses ranged from 1 (use of a single psychotropic medication) to 5 (use of five psychotropic medications).

Antipsychotic Usage. Based on the names of the psychotropic medications provided by participants each medication was coded into its respective classification (i.e. antidepressant, anxiolytic, antipsychotic, or mood stabilizer). Medications were coded as 1 if the medication was within the class and 0 if the medication was not in that class.

Outcomes

Perceived Burdensomeness and Thwarted Belongingness. The Interpersonal Needs Questionnaire-10-Item Version (INQ-10; Van Orden, Cukrowicz, Witte, & Joiner, 2012) is a self-report questionnaire assessing the components comprising suicidal desire as conceptualized by the IPTS. Items are scored on a Likert scale ranging from 1 (*Not at all true for me*) to 7 *(Very true for me)*, with higher scores indicating greater risks for these two components. Although less commonly used than the INQ-15, this version of the measure has demonstrated comparable psychometric properties (Hill et al., 2014). Alpha equaled 0.88 for the perceived burdensomeness subscale and 0.72 for thwarted belongingness.

Risk for Suicide. The MINI was again utilized to assess current (past month) suicide risk and attempt history. The MINI includes 11 items assessing a variety of suicide risk factors present within the past month: (1) experience of an accident in which the individual intended to injure themselves or die, (2) hopelessness, (3) thoughts of being better off dead, (4) a desire to harm oneself, (5) thoughts about suicide, (6) difficulties controlling impulses to end one's life, (7) presence of a suicide plan, (8) actions taken in preparation to injure or kill oneself, (9) past month non-suicidal self-injury, (10) a past month suicide attempt, (11) a lifetime suicide attempt. A score is obtained by summing the values from the endorsed items. Scores can range from 0 (no risk) to 52 (high suicide risk). The MINI suicidal risk index has been shown to predict suicidal behaviors over the course of one year (Roaldset, Linaker, & Bjørkly, 2012).

Covariates

Depressive & Anxiety Symptom Severity. The Depression, Anxiety, Stress Scale (DASS-21; Lovibond & Lovibond, 1995) is a 21-item self-report questionnaire designed to assess the unique symptoms of depression, anxiety, and stress. Items are rated from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). The Depression scale was utilized to assess the severity of dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest, anhedonia, and inertia experienced within the past week. The Anxiety scale was utilized to assess the severity of irritability, agitation, difficulty relaxing, and impatience experienced within the past week. Depression and anxiety symptom severity were utilized as covariates to ensure that the severity of psychopathology was not a better explanation for higher rates of suicidal desire than was psychotropic medication usage. The DASS has demonstrated adequate psychometric properties (Antony, Bieling, Cox, Enns, & Swinson, 1998). The alpha coefficient was 0.90 for the depression subscale and 0.84 for the anxiety subscale.

Borderline Personality Disorder (BPD) Symptom Severity. The Borderline Evaluation of Severity Over Time (BEST; Pfohl et al., 2009) is a 15-item, self-report measure of past month BPD symptom severity. Items 1 through 12 are rated from 1 (*no distress*) to 5 (*extreme distress*), and items 13 through 15 are rated from 1 (*almost never*) to 5 (*almost always*). The BEST has demonstrated adequate reliability and validity (Pfohl et al., 2009). BEST scores were included to account for severity of BPD symptom severity. Internal consistency in our analysis was 0.83.

Substance Use Severity. The Drug Use Questionnaire (DUQ; Hien & First, 1991) is a 10-item, self-report questionnaire assessing frequency of alcohol and drug use over

the past year. Item responses are summed, creating an overall score representative of past-year substance use frequency for various substances. The overall score for substance use frequency did not include the frequency of nicotine use in this study. The DUQ has demonstrated good convergent validity with structured interview diagnoses in association with relevant clinical outcomes (Lejuez, Bornvalova, Reynolds, Daughters, & Curtin, 2007). Here again, DUQ scores were included to account for the impact of the severity of psychopathology.

Demographics

Demographic covariates were determined empirically by testing for significant associations between the predictor and outcome variables and gender, race, age, education level, employment status, marital status, and total household income.

Procedures

All procedures were reviewed and approved by the relevant Institutional Review Boards prior to the onset of data collection. Data was collected as part of a broader study examining risky behaviors among SUD patients (N = 226). Inclusion criteria for the initial study included: cocaine and/or alcohol dependence, a Mini-Mental Status Exam (MMSE; Folstein, Folstein, & McHugh, 1975) score of ≥ 24, and absence of current psychotic disorders. In order to produce a sample with negligible withdrawal effects, eligible participants were recruited for participation no sooner than 72 hours from entry into the treatment facility. Additionally, patients were also required to undergo detoxification from an external source prior to entry into treatment, further reducing potential confounds related to withdrawal. The initial study was completed over a total of three sessions. All of the data used in the current study were collected in the first

session of the initial study, and data unrelated to the current study were collected in the remaining two sessions (e.g. heart rate variability, cortisol levels, and distress levels). One participant from the original study was not included in the current study due to lack of information regarding the use of psychotropic medication.

Data Analytic Procedures

In order to test our hypotheses, nine Analyses of Covariance (ANCOVAs) were conducted. PB served as the outcome variable within three analyses, TB served as the outcome variable in three analyses, and suicide risk served as the outcome variable in the remaining three analyses. Within all nine analyses, severity of psychopathology was accounted for by including depression, anxiety, BPD severity, and frequency of substance use as covariates. Additionally, for analyses in which PB was the outcome variable, TB was included as a covariate. For analyses in which TB was the outcome variable, PB was included as a covariate. The use of psychotropic medication (none vs. 1+) served as the predictor variable for the first three analyses and the number of psychotropic medications (none or one vs. 2+) utilized served as the predictor variable for the second three analyses. Finally, the use of an antipsychotic (vs. use of other psychotropics) served as the predictor variable for the final three analyses examining the association between antipsychotics and suicidal desire. In the final analysis, only individuals currently prescribed one or more psychotropic medications were included.

In an effort to increase specificity, an exploratory analysis consisting of nine ANCOVAs was conducted. The use of an antidepressant (versus use of other psychotropics) served as our predictor in the first three analyses, the use of an anxiolytic served as the predictor in the second three analyses, and the use of a mood stabilizer

served as the predictor for the final three analyses. Again, PB, TB, and suicide risk served as the outcome variables, and depression, anxiety, and BPD severity were included as covariates.

CHAPTER III

RESULTS

Examination of Distributions

PB, TB, and suicide risk all exhibited significant skew and/or kurtosis and were thus rank transformed using Blom's formula to better approximate a normal distribution.

Selection of Covariates

In order to determine the appropriate covariates to be included within analyses, a series of analyses of variance (ANOVA) were utilized to determine between group differences in PB, TB, and suicide risk for the demographic variables sex, race, employment status, and relationship status. ANOVAs were also conducted to determine if significant differences in psychotropic medication use, number of psychotropic medications used, and antipsychotic use existed for continuous demographic variables (age, total family income, and education level). Results indicated significant differences between the various statuses of employment for suicide risk (F (5, 213) = 2.67, $p < 0.05$) and educational levels for psychotropic medication use (F (9, 211) = 2.29, $p < 0.05$) and number of psychotropic medication used (F (9, 211) = 3.00, $p < 0.01$). No other between group differences were significant.

Next, a series of chi-square analyses were utilized to determine if significant differences in psychotropic medication use, number of psychotropic medications used and antipsychotic use existed for sex, race, employment status, and relationship status. Results indicated that gender (χ^2(1, N = 222) = 16.24, $p < 0.01$) and race (χ^2(4, N = 222) = 17.81, $p < 0.01$) were significantly associated with psychotropic medication use. Additionally, gender (χ^2(1, N = 222) = 9.12, $p < 0.01$) and race (χ^2(4, N = 222) = 17.81, p

< 0.01) were significantly associated with number of psychotropic medications used. No other chi-square analyses were significant.

Finally, zero-order correlations were used to examine associations between continuous demographic variables (age, total family income, and education level) and TB, PB and suicide risk. Results revealed significant correlations between education level and TB ($r = 0.17$, $p < 0.05$). No other zero-order correlations were significant.

In summary, depression, anxiety and BPD severity and frequency of substance abuse not including nicotine were included as covariates in all analyses. Gender, race, and education level were included as covariates for all analyses involving psychotropic medication use and number of psychotropic medications used. Education was also included in analyses involving PB, and employment status was included in all analyses involving suicide risk.

Primary Analyses

In order to test hypotheses, three series of ANCOVAs were conducted. The first series of ANCOVAs assessed whether the use of psychotropic medication was associated with higher mean levels of TB, PB, and suicide risk. Results revealed a statistically significant difference in suicide risk ($F(9, 191) = 9.62$, $p < 0.01$) between individuals utilizing one or more psychotropic medications and individuals not utilizing a psychotropic medication, accounting for gender, race, employment status, education level, and severity of psychopathology and substance use. Results also revealed non-significant differences in PB ($F(9, 187) = 0.067$, $p = 0.80$) and TB ($F(9, 187) = 0.015$, $p = 0.90$) between individuals utilizing at least one psychotropic medication and individuals utilizing no psychotropic medications (Table 4).

The second series of ANCOVAs assessed whether the number of psychotropic medications was associated with higher mean levels of PB, TB, and suicide risk. Results revealed non-significant differences in PB ($F(9, 187) = 0.12$, $p = 0.73$), TB ($F(9, 187) = 1.49$, $p = 0.22$), and suicide risk ($F(9, 191) = 0.50$, $p = 0.48$) between individuals utilizing one or no psychotropics and individuals utilizing two or more psychotropics (Table 5).

The third series of ANCOVAs assessed whether antipsychotic use was associated with higher mean levels of PB, TB, and suicide risk relative to the use of other classes of psychotropics. Results revealed a non-significant difference in PB ($F(6, 89) = 1.29$, $p = 0.26$), TB ($F(7, 88) = 0.50$, $p = 0.48$), and suicide risk ($F(6, 92) = 0.016$, $p = 0.90$; Table 6).

Exploratory Analyses

In an effort to increase specificity, exploratory analyses were conducted. These analyses consisted of nine ANCOVAs, similar to the final three ANCOVAs used to test our hypotheses regarding the use of an antipsychotic, with the difference being that the predictor variable, antipsychotic use (versus other psychotropic medication), was replaced with either antidepressant use, anxiolytic use, or mood stabilizer use (versus other psychotropic medication use). PB, TB, and suicide risk served as the outcome variables. Again, depression, anxiety, and BPD severity, and substance use were included as covariates in addition to the demographics previously found to have either between group differences for or significant associations with TB, PB, and suicide risk. Additional demographic covariates were determined using both ANOVAs and Chi Square tests prior to testing any hypotheses. Results indicated significant differences in total family income for anxiolytic use ($F(10, 101) = 3.74$, $p < 0.001$) and a significant

association between gender and mood stabilizer use ($\chi^2(1, N = 112) = 5.66$, $p = 0.017$). Results revealed a significant difference in mean levels of PB ($F(1, 91) = 4.59$, $p < 0.05$) between individuals utilizing antidepressants and individuals utilizing another psychotropic other than an antidepressant. All other exploratory analyses yielded non-significant findings.

Table 4

Mean Differences between Individuals Utilizing a Psychotropic and Not Utilizing a Psychotropic on Suicidal Desire and Risk.

	No Psychotropic Use		Psychotropic Use				
	M	*SD*	M	*SD*	*F*	*p*	η^2
Burdensomeness	11.78	8.32	11.08	7.08	0.07	0.80	0.00
Belongingness	17.76	7.22	18.53	7.56	0.02	0.90	0.00
Suicide Risk	2.59	5.72	5.82	9.64	9.62*	0.002	0.05

Note: * = significant at $p < .05$, ** = significant at $p < .001$; Perceived Burdensomeness: Interpersonal Needs Questionnaire-Perceived Burdensomeness subscale; Thwarted Belongingness: Interpersonal Needs Questionnaire-Thwarted Belongingness subscale. Means and standard deviations reflect non-transformed Perceived Burdensomeness Thwarted Belongingness and Suicide Risk, but tests of between group differences are drawn from transformed totals.

Table 5

Mean Differences between Individuals Utilizing 0 or 1 Psychotropic and 2 or More Psychotropics on Suicidal Desire and Risk.

	Use of 0 or 1 Psychotropic		Use of 2 or More Psychotropics				
	M	*SD*	M	*SD*	*F*	*p*	η^2
Burdensomeness	11.40	7.83	11.58	7.29	0.12	0.73	0.00
Belongingness	18.05	7.42	18.57	7.31	1.49	0.22	0.01
Suicide Risk	3.57	7.07	6.95	11.14	0.50	0.48	0.00

Note: * = significant at $p < .05$, ** = significant at $p < .001$; Perceived Burdensomeness: Interpersonal Needs Questionnaire-Perceived Burdensomeness subscale; Thwarted Belongingness: Interpersonal Needs Questionnaire-Thwarted Belongingness subscale. Means and standard deviations reflect non-transformed Perceived Burdensomeness Thwarted Belongingness and Suicide Risk, but tests of between group differences are drawn from transformed totals.

Table 6

Mean Differences between Individuals Utilizing an Antipsychotic and Individuals not Utilizing an Antipsychotic on Suicidal Desire and Risk.

	No Antipsychotic Use		Antipsychotic Use				
	M	*SD*	M	*SD*	*F*	*p*	η^2
Burdensomeness	10.42	6.46	12.80	7.47	1.29	0.26	0.01
Belongingness	18.24	7.48	20.11	7.86	0.50	0.48	0.01
Suicide Risk	5.54	9.44	6.82	10.76	0.02	0.90	0.00

Note: * = significant at $p < .05$, ** = significant at $p < .001$; Perceived Burdensomeness: Interpersonal Needs Questionnaire-Perceived Burdensomeness subscale; Thwarted Belongingness: Interpersonal Needs Questionnaire-Thwarted Belongingness subscale. Means and standard deviations reflect non-transformed Perceived Burdensomeness Thwarted Belongingness and Suicide Risk, but tests of between group differences are drawn from transformed totals.

Table 7

Mean Differences between Individuals Utilizing an Antidepressant and Individuals not Utilizing an Antidepressant on Suicidal Desire and Risk.

	No Antidepressant Use		Antidepressant Use				
	M	*SD*	M	*SD*	*F*	*p*	η^2
Burdensomeness	12.72	7.77	10.54	6.81	4.59	0.035	0.048
Belongingness	18.67	6.93	18.49	7.79	1.21	0.27	0.013
Suicide Risk	6.70	9.34	5.49	9.79	2.59	0.11	0.027

Note: * = significant at $p < .05$, ** = significant at $p < .001$; Perceived Burdensomeness: Interpersonal Needs Questionnaire-Perceived Burdensomeness subscale; Thwarted Belongingness: Interpersonal Needs Questionnaire-Thwarted Belongingness subscale. Means and standard deviations reflect non-transformed Perceived Burdensomeness Thwarted Belongingness and Suicide Risk, but tests of between group differences are drawn from transformed totals.

Table 8

Mean Differences between Individuals Utilizing an Anxiolytic and Individuals not Utilizing an Anxiolytic on Suicidal Desire and Risk.

	No Anxiolytic Use		Anxiolytic Use				
	M	*SD*	M	*SD*	*F*	*p*	η^2
Burdensomeness	11.42	7.36	9.86	5.98	0.15	0.70	0.002
Belongingness	18.77	7.78	17.68	6.82	0.061	0.81	0.001
Suicide Risk	5.87	10.05	5.63	8.17	2.96	0.089	0.031

Note: * = significant at $p < .05$, ** = significant at $p < .001$; Perceived Burdensomeness: Interpersonal Needs Questionnaire-Perceived Burdensomeness subscale; Thwarted Belongingness: Interpersonal Needs Questionnaire-Thwarted Belongingness subscale. Means and standard deviations reflect non-transformed Perceived Burdensomeness Thwarted Belongingness and Suicide Risk, but tests of between group differences are drawn from transformed totals.

Table 9

Mean Differences between Individuals Utilizing a Mood Stabilizer and Individuals not Utilizing a Mood Stabilizer on Suicidal Desire and Risk.

	No Mood Stabilizer Use		Mood Stabilizer Use				
	M	*SD*	M	*SD*	*F*	*p*	η^2
Burdensomeness	10.96	7.19	11.61	6.75	0.060	0.81	0.001
Belongingness	18.18	7.53	20.05	7.74	0.019	0.89	0.000
Suicide Risk	5.61	9.45	6.58	10.48	0.41	0.53	0.004

Note: * = significant at $p < .05$, ** = significant at $p < .001$; Perceived Burdensomeness: Interpersonal Needs Questionnaire-Perceived Burdensomeness subscale; Thwarted Belongingness: Interpersonal Needs Questionnaire-Thwarted Belongingness subscale. Means and standard deviations reflect non-transformed Perceived Burdensomeness Thwarted Belongingness and Suicide Risk, but tests of between group differences are drawn from transformed totals.

CHAPTER IV

DISCUSSION

This study aimed to examine the relationship between psychotropic medication usage and suicidal desire and risk. Specifically, this study aimed to indicate whether the use of psychotropic medication, use of multiple psychotropic medications, and usage of an antipsychotic were associated with heightened levels of PB, TB, and risk for suicide. Results were mostly inconsistent with hypotheses; however, results supported the hypothesis that the use of psychotropic medication would result in a higher overall risk for suicide. Additional exploratory analyses also revealed that the use of an antidepressant resulted in lower levels of PB than the use of any other class of psychotropic medication.

As expected, risk for suicide significantly differed between individuals utilizing psychotropic medication(s) and individuals not utilizing psychotropic medication. Individuals utilizing psychotropics exhibited higher mean levels for suicide risk than individuals not utilizing psychotropics (non-transformed means = 5.82 versus 2.59), suggesting that individuals utilizing a psychotropic are at an increased risk for suicide relative to individuals not utilizing a psychotropic, even after accounting for the severity of the psychopathology that prompted the prescription of the medication(s).

The non-significant difference in levels of PB and TB as a result of both psychotropic medication use and use of multiple psychotropics may be due to the sample composition, as the majority of the sample for this study was comprised of individuals who identified as White/Caucasian and marginally consisted of more females than males. Furthermore, the majority of individuals utilizing psychotropic medications were

White/Caucasian females. The negative stigma associated with the use of psychotropic medication may be diminished or even nonexistent for women and certain racial/ethnic groups. Specifically, the use of psychotropic medications by white females may not be associated with a negative stigma among such individuals because of its prevalent use within this gender. A study examining the trends in psychotropic medication use discovered that utilization of an antidepressant within females was twice the rate of that in males (Paulose-Ram, Safran, Jonas, Gu, & Orwig, 2007). Furthermore, non-Hispanic white individuals had a higher utilization rate relative to non-Hispanic blacks and Mexican-Americans, specifically, non-Hispanic blacks and Mexican-Americans utilized antidepressants 55% and 67% less than non-Hispanic whites.

The lack of significant findings may also be due to the measure of PB and TB utilized. The questions within the INQ prompt participants to consider their feelings within a recent timeframe (i.e. "these days"), implying that responses reference feelings which were active in the here and now, rather than within their lifetime or even the recent past. It is possible that participants' levels of PB and TB may have decreased upon entry into the treatment facility, especially given the fact that participants were required to undergo detox for a period of time prior to entry into the facility. This explanation is underscored by the finding of a significant difference in suicide risk between individuals utilizing a psychotropic and individuals not utilizing a psychotropic, as the MINI examines past moth and lifetime frequency; thus, suggesting that psychotropic medication use was related to suicide when assessed within a broader timeframe. It is also possible that the relationship between psychotropic medication use and suicide is

independent of TB and PB, operating through different mechanisms not considered within the proposed model.

Another possible explanation for the lack of significances may be the setting in which the study was conducted. All participants within this study resided at a residential treatment facility during the study. Psychotropic medication use was typical among participants, as 49.8% of participants utilized a psychotropic medication; thus, the use of a psychotropic medication may be considered more socially acceptable within this particular setting. This explanation is analogous with Fife et al.'s (2012) finding that psychiatric and substance abuse outpatients displayed more favorable attitudes regarding the use of psychotropic medication relative to individuals never having utilized a psychotropic medication.

An additional interpretation of these results might be that the relationship between suicide risk and psychotropic medication is bidirectional. It may be more likely that a psychotropic medication is frequently prescribed in response to an overt endorsement of suicide (e.g., a prior suicide attempt), whereas report of a broader vulnerability (i.e. TB or PB) may be less likely to prompt the prescription of psychotropic medication.

Although unexpected, levels of PB significantly differed among individuals utilizing antidepressants and individuals utilizing another type of psychotropic, with individuals utilizing antidepressants displaying lower mean levels of PB (10.54 Vs. 12.72). This significant difference implies that individuals utilizing antidepressants experience reduced feelings of PB. Further, these findings suggest that

the relationship between psychotropics and suicidality may not be explained by either the side effects or stigmas associated with such medication.

Findings from the current study should be considered within the context of their limitations. As noted before, one such limitation was the sample composition. The generalizability of our results to populations other than SUD inpatient populations is unclear. Additionally, inter-rater reliability for the structured interviews utilized in this study was unavailable. Future studies should replicate these procedures in various populations and establish inter-rater reliability for structured interviews.

Despite these limitations, this study has significant scientific and clinical implications. Scientifically, the data provide evidence that psychotropic medication use may increase an individual's risk for suicide. Furthermore, the study indicates a need for future research examining the mechanisms influencing the relationship between psychotropic medication and suicide. Clinically, the findings from this study may serve to increase awareness among prescribing physicians and clinicians, in turn prompting physicians and clinicians to perform routine suicide risk assessments for individuals utilizing psychotropic medication(s).

REFERENCES

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment*, *10*(2), 176.

Baghai, T. C., Blier, P., Baldwin, D. S., Bauer, M., Goodwin, G. M., Fountoulakis, K. N., & ... Möller, H. (2011). General and comparative efficacy and effectiveness of antidepressants in the acute treatment of depressive disorders: A report by the WPA Section of Pharmacopsychiatry. *European Archives of Psychiatry and Clinical Neuroscience*, *261*(Suppl 3), S207-S245.

Bell, E. C., Willson, M. C., Wilman, A. H., Dave, S., & Silverstone, P. H. (2005). Differential effects of chronic lithium and valproate on brain activation in healthy volunteers. *Human Psychopharmacology: Clinical and Experimental*, *20,* 415–424.

Bertolote, J., & Fleischmann, A. (2002). Suicide and psychiatric diagnosis: A worldwide perspective. *World Psychiatry: Official Journal of the World Psychiatric Association (WPA)*, *1*(3), 181-5.

Brown, P. J., Stout, R. L., & Mueller, T. (1996). Posttraumatic stress disorder and substance abuse relapse among women: A pilot study. *Psychology of Addictive Behaviors, 10,* 124-128.

Blake, D. D., Weathers, F. W., Nagy, L. M. et al. (1990). A clinician rating scale for assessing current and lifetime PTSD: The CAPS-1. *Behavior Therapist, 13,* 187-188.

Centers for Disease Control and Prevention. (2015). Web-Based Injury Statistics Query and Reporting System (WISQARS). Available at http://www.cdc.gov/injury/wisqars/index.html. Accessed April 29, 2015.

Colman, I., Croudace, T. J., Wadsworth, E. J., & Jones P. B. (2008). Factors associated with antidepressant, anxiolytic and hypnotic use over 17 years in a national cohort. *Journal of Affective Disorders, 110*(3), 234-240.

Culver, J. L., Arnow, B. A., & Ketter, T. A. (2007). Bipolar disorder: improving diagnosis and optimizing integrated care. *Journal of Clinical Psychology, 63*(1), 73-92.

Ernst, C. L., & Goldberg, J. F. (2004). Antisuicide properties of psychotropic drugs: a critical review. *Harvard Review of Psychiatry, 12*(1), 14-41.

Fife, S. A., Ketzenberger, K. E., & Olson, J. N. (2012). Attitudes toward psychotropic medications. *Psychological Reports, 110*(2), 475-476.

First, Michael B., Spitzer, Robert L, Gibbon Miriam, and Williams, Janet B.W. *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Patient Edition*. (SCID-I/P) New York: Biometrics Research, New York State Psychiatric Institute, November 2002.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-mental state": a practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research, 12*(3), 189-198.

Fontanella, C. A., Bridge, J. A., & Campo, J. V. (2009). Psychotropic medication changes, polypharmacy, and the risk of early readmission in suicidal adolescent inpatients. *Annals of Pharmacotherapy, 43*(12), 1939-1947.

Glazer, W. (2000). Review of incidence studies of tardive dyskinesia associated with atypical antipsychotics. *Journal of Clinical Psychiatry, 61*(Suppl 4), 15–20.

Hassan, G. A. (2012). Black-box warning and psychiatric drugs: a problem or a solution? *Middle East Current Psychiatry, 19*(2), 67-70.

Hien, D. A., & First, M. (1991). Drug Use Questionnaire. Unpublished scale, Columbia College of Physicians and Surgeons, New York State Psychiatric Institute.

Hill, R. M., Rey, Y., Marin, C. E., Sharp, C., Green, K. L., & Pettit, J. W. (2015). Evaluating the Interpersonal Needs Questionnaire: comparison of the reliability, factor structure, and predictive validity across five versions. *Suicide and Life-Threatening Behavior*, *45*(3), 302-314.

Interian, A., Martinez, I. E., Guarnaccia, P. J., Vega, W. A., & Escobar, J. I. (2007). A qualitative analysis of the perception of stigma among Latinos receiving antidepressants. *Psychiatric Services (Washington, D.C.), 58*(12), 1591-1594.

Joiner, T.E. (2005). *Why People Die by Suicide*. Cambridge, MA: Harvard University Press.

Kranke, D., Floersch, J., Townsend, L., & Munson, M. (2010). Stigma experience among adolescents taking psychiatric medication. *Children and Youth Services Review*, *32*(4), 496-505.

Lejuez, C. W., Bornovalova, M. A., Reynolds, E. K., Daughters, S. B., & Curtin, J. J. (2007). Risk factors in the relationship between gender and crack/cocaine. *Experimental and Clinical Psychopharmacology*, *15*, 165-175.

Leo, R. J. (1996). Movement disorders associated with the serotonin selective reuptake inhibitors. *Journal of Clinical Psychiatry, 57,* 449-454.

Lobbestael, J., Leurgans, M., & Arntz, A. (2011). Inter-rater Reliability of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID I) and Axis II Disorders (SCID II). *Clinical Psychology & Psychotherapy,* 18(1), 75-79.

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*(3), 335-343.

Marder, S. R. (2000). Integrating pharmacological and psychosocial treatments for schizophrenia. *Acta Psychiatrica Scandinavica*, *102*(Suppl407), 87-90.

Maxmen, J. S. & Ward, N. G. (1995). *Psychotropic Medications Fast Facts* (2nd ed.). New York: W.W. Norton.

Murray, T.L. (2006). The other side of psychopharmacology: A review of the literature. *Journal of Mental Health Counseling 28*(4), 309-337.

Novak, L. & Švab, V. (2009). Antipsychotics side effects' influence on stigma of mental illness: Focus group study results. *Psychiatria Danubina*, *21*(1), 99-102.

Ozmen, E., Ogel, K., Aker, T., Sagdutu, A., Tamar, D., & Boratay, C. (2005). Public opinions and beliefs about the treatment of depression in urban Turkey. *Social Psychiatry and Psychiatric Epidemiology, 40*(11), 869-76.

Paulose-Ram, R., Safran, M. A., Jonas, B. S., Gu, Q., & Orwig, D. (2007). Trends in psychotropic medication use among U.S. adults. *Pharmacoepidemiology and Drug Safety*, *16*(5), 560-570.

Pfohl, B., Blum, N., John, D. S., McCormick, B., Allen, J., & Black, D. W. (2009). Reliability and validity of the Borderline Evaluation of Severity Over Time

(BEST): a self-rated scale to measure severity and change in persons with borderline personality disorder. *Journal of Personality Disorders, 23*(3), 281.

Ponterotto, J. G. (1985). A Counselor's Guide to Psychopharmacology. *Journal of Counseling and Development,64,* 109-115.

Rissanen, I., Jääskeläinen, E., Isohanni, M., Koponen, H., Joukamma, M., Alaräisänen, A., & Miettunen, J. (2012). Use of antipsychotic medication and suicidality-the Northern Finland Birth Cohort 1996. *Human Psychopharmacology: Clinical and Experimental, 27*(5), 476-485.

Roaldset, J. O., Linaker, O. M., & BjØrkly, S. (2012). Predictive validity of the MINI suicidal scale for self-harm in acute psychiatry: A prospective study of the first year after discharge. *Archives of Suicide Research, 16,* 287-302.

Ryan R. M. & Deci E. L. (2005). The darker and brighter sides of human existence: Basic psychological needs as a unifying concept. *Psychological Inquiry, 11(*4), 319–338.

Sheehan, D. V., Janavs, J., Harnett-Sheehan, K., Sheehan, M., & Gray, C., (2009). Mini International Neuropsychiatric Interview, version 6.0.0. Retrieved from http://www.psychiatrist.com/private/2010/v71e01/v71e0101/v71e0101L2.pdf

Sheehan, D., Lecrubier, Y., Sheehan, K., Janaus, J., Weiller, E., Keskiner, A., & Schinka, J., (1997). The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *European Psychiatry 12*, 232-241.

Substance Abuse and Mental Services Administration. (2013). Drug Abuse Warning Network, 2011: National estimates of drug-related emergency department visits.

HHS Publication No. (SMA) 13-4760, DAWN Series D-39. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Ting, S. A., Sullivan, A. F., Boudreaux, E. D., Miller, I., & Camargo, C. A. (2012). Trends in US emergency department visits for attempted suicide and self-inflicted injury, 1993–2008. *General Hospital Psychiatry*, *34*(5), 557-565.

Van Orden, K. A., Cukrowicz, K. C., Witte, T. K., & Joiner Jr, T. E. (2012). Thwarted belongingness and perceived burdensomeness: construct validity and psychometric properties of the Interpersonal Needs Questionnaire. *Psychological Assessment*, *24*(1), 197.

Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T. J. (2010). The interpersonal theory of suicide. *Psychological Review*, *117*(2), 575-600.