Suicidal ideation and risk factors in primary care patients with anxiety disorders

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ABSTRACT

The presence of an anxiety disorder is associated with greater frequency of suicidal thoughts and behaviors. Given the high personal and societal costs of suicidal behaviors, suicide prevention is a priority. Understanding factors present within individuals with anxiety disorders that increase suicide risk may inform prevention efforts. The aims of the present study were to examine the prevalence of suicidal ideation and behaviors, as well as factors associated with suicide risk in patients with anxiety disorders in primary care. Data from a large scale randomized controlled study were analyzed to assess prevalence of suicidal thoughts and behaviors, as well as factors associated with suicide risk. Results revealed that suicidal ideation and behaviors were relatively common in this group. When examining mental and physical health factors jointly, presence of depression, mental health-related impairment, and social support each uniquely accounted for variance in suicide risk score. Methodological limitations include cross-sectional data collection and lack of information on comorbid personality disorders. Moreover, patients included were from a clinical trial with exclusion criteria that may limit generalizability. Results highlight the complex determinants of suicidal behavior and the need for more nuanced suicide assessment in this population, including evaluation of comorbidity and general functioning.

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1. Introduction

Global estimates suggest that each year there are 10–20 million suicide attempts and one million completed suicides (World Health Organization (WHO), 1999). Suicide attempts are costly in terms of occupational and interpersonal disruption (American Foundation for Suicide Prevention, 2009). Moreover, substantial financial costs are associated with the intensive psychiatric resources devoted to these patients (Rissmiller et al., 1994). Thus, understanding features and correlates of suicide is a critical public health matter.

One challenge in studying suicide is the relatively low base rate of attempted and completed suicides observed in most populations. Valuable information may instead be gained by studying factors that are associated with increased risk of suicide. Suicidal ideation and past suicide attempts are associated with risk for future suicide attempts and completions (Harris and Barraclough, 1997; Kessler et al., 1999; Kuo et al., 2001; Joiner et al., 2003; ten Have et al., 2009). Studying such thoughts and behaviors, therefore, may increase our understanding of who is likely to attempt or complete suicide, potentially informing suicide risk management and prevention efforts.

The presence of current or lifetime anxiety disorders, including panic disorder (PD), social phobia (SP), generalized anxiety disorder (GAD), and posttraumatic stress disorder (PTSD), is associated with increased suicide risk (Khan et al., 2002; Cougle et al., 2009a,b; Nepon et al., 2010; Nock et al., 2010; Lopez-Castroman et al., 2011). Individuals with anxiety disorders demonstrate increased suicidal ideation (Sareen et al., 2005a) and rates of self injury (Chartrand et al., 2012) and more frequent suicide attempts (Bolton et al., 2008; Sareen et al., 2005a,b) than those without mental health disorders. For these reasons, understanding factors associated with suicide risk within individuals with anxiety disorders is critical to managing this population.

In spite of the increased risk of suicide within anxiety disordered patients, the specific determinants of risk within this group are poorly understood. Studies of individuals with specific anxiety disorders including PD, SP, and PTSD indicate that the additional presence of depression and substance use disorders increases suicide risk (Noyes et al., 1991; Lepine et al., 1993; Warshaw et al., 1995, 2000). Severity and aspects of functional impairment are also related to suicide risk in patients with anxiety disorders. For example, anxiety symptom severity is associated with increased suicidal ideation and attempts in PD and PTSD patients (Noyes et al., 1991; Freeman and Moore, 2000; Huang et al., 2010). Associations between suicide risk and impairment in general functioning in PTSD (Tarrier and Gregg, 2004; Panagioti et al., 2011) and social functioning in both PTSD and PD (Noyes et al., 1991; Huang et al., 2010; Panagioti et al., 2011) are also documented. However, few studies in patients with anxiety disorders comprehensively account for mental *and* physical health conditions and impairment that may be associated with suicide risk (although see Freeman and Moore (2000) for an exception). The high comorbidity of anxiety disorders and physical health problems (Maier and Falkai, 1999; Levinson et al., 2008; Castro et al., 2009; Nicolson et al., 2009) suggests that the relationship between physical health and suicide in this population merits consideration. Physical health factors generally associated with suicide risk include pain (Braden and Sullivan, 2008; Ilgen et al., 2008), chronicity of medical conditions (Goodwin et al., 2003; Bartels et al., 2002; Robson et al., 2010), and functional limitation due to physical conditions (Kaplan et al., 2007; Park et al., 2010). Thus, our aim was to examine the potential contribution of these factors, along with other established predictors, to suicidality in individuals with anxiety disorders.

Primary care is an important setting to examine correlates of suicide risk in patients with anxiety disorders for a number of reasons. Anxiety and comorbid physical health conditions often present in primary care settings (Serrano-Blanco et al., 2010), and patients with anxiety disorders are often diagnosed and treated in primary care settings (Bijl and Ravelli, 2000; Price et al., 2000; Shear and Schulberg, 1995; Weisberg et al., 2007). Moreover, many individuals who eventually commit suicide present to primary care within weeks or days of making a suicide attempt (Luoma et al., 2002). Knowledge of potential risk factors could improve risk management in this setting by alerting providers to critical features of patients who may be likely to attempt suicide.

Given the great social and economic burden associated with suicide and its relatively high prevalence in primary care, examination of the features of suicide risk behaviors in this setting is warranted. The present study examined suicide risk variables in a sample of individuals with one or more anxiety disorders referred from primary care as part of the Coordinated Anxiety Learning and Management (CALM) study (Roy-Byrne et al., 2010). The first aim of the present study was to first examine the prevalence of suicidal ideation and behaviors in a large group of individuals recruited from the primary care setting. Second, we sought to examine which clinical factors were associated with suicide risk in these patients. To do so, we examined correlational and regression analyses of factors previously documented to be associated with suicide (including mental and physical health variables, as well as social support), and suicide risk score.

2. Methods

2.1. Participants

Participants were 1620 individuals who completed an initial eligibility assessment in a randomized controlled effectiveness trial comparing the CALM intervention to usual care conducted between June 2006 and August 2008 (UC; Roy-Byrne et al., 2010; clinicaltrials.gov Identifier NCT00347269). Study procedures were reviewed and approved by the institutional review boards at all study sites. Eligible participants were between the ages of 18 and 75, met DSM-IV criteria for at least one anxiety disorder (SP, GAD, PTSD or PD), and indicated a score of eight or greater (moderate anxiety symptoms on a scale ranging from 0 to 20) on the Overall Anxiety Severity and Impairment Scale (OASIS; Campbell-Sills et al., 2009). All participants who completed the eligibility screening are reported for analyses of prevalence of suicide risk variables. Because excluded participants did not complete a comprehensive assessment battery, only those meeting inclusion criteria (N=1002) were considered for regression analyses of suicide risk. Including the larger initial sample of individuals who conducted the screening allowed for examination of baseline rates *before* individuals who met exclusion criteria (including suicidality) were removed from the trial. Information on both the full sample and the screened sample are reported in the prevalence data for suicide risk variables. Exclusion criteria included the presence of life-threatening medical conditions, marked cognitive impairment, active suicidal or homicidal intent or plan, Bipolar I disorder, current substance dependence (except alcohol and marijuana), ongoing treatment in a cognitive behavioral intervention program, and inability to speak either English or Spanish. A total of 10 individuals were removed from the study for suicide or homicide-related reasons. Potential participants were referred from primary care physicians in 17 primary care clinics from four U.S. regions. Table 1 presents demographic data for the sample.

2.2. Assessments

2.2.1. Diagnostic status and suicide risk score

A trained study clinician administered the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1998) to participants to determine diagnostic status (including presence of current SUDs and MDD) and assess for study eligibility. As part of this assessment, individuals completed a suicide risk module in which they were asked about the presence and severity of risk factors for future suicidal action. Specifically, participants were asked about a history of accidents with intention of self harm, passive suicidal ideation ("thinking you were better off dead"), desire for self harm, thoughts of suicide including frequency and intensity, and history of suicide attempts. Participants endorsing suicidal ideation were also asked about suicide plan and/or action upon plan, self injury, current intention for

self harm, and self-reported impulse control. Consistent with prior studies, a suicide risk score (ranging from 0 to 33) was calculated by weighting and summing items from this module (e.g., Tang et al., 2010; Quevedo et al., 2011; Pompilli et al., 2012). Items that are more strongly associated with suicide are given higher weight.

2.2.2. Mental and health variables

Participants were contacted via telephone by the RAND Corporation to complete a baseline assessment that included assessment of physical and mental health disability and social support. Symptom severity was operationalized using psychic and somatic anxiety symptoms assessed using 12 items from the anxiety and somatization subscales of the 18-item Brief Symptom Inventory (BSI-12; Derogatis and Savitz, 2000). Mental health-related disability was assessed using the Sheehan Disability Scale (SDS; Sheehan et al., 1996), which asks participants to rate how much their anxiety and depression interferes with occupational, social, and family/home responsibility domains.

2.2.3. Physical health variables

Physical health-related functioning (i.e., inability to complete daily tasks of living and work due to physical limitations) was assessed using the physical health composite score of the 12-item short form Heath Survey version 2 (PCS; Ware et al., 2002). Pain was assessed using one item from the EQ-5D (EQ-5D-pain; EuroQol Group, 1990) that asks participants to rate their level of pain on a three-point scale ("I have no/moderate/extreme pain or discomfort"). To assess total number of medical conditions, participants were read a list of serious medical conditions (e.g., asthma, arthritis, cancer) and asked if a doctor had ever told them they had such a condition.

2.2.4. Social support

Four items from the MOS Social Support Survey (MOS-SSS; Sherbourne and Stewart, 1991) were used to assess perceived social support. These items ask about the level of support received by participants during relaxing activities, availability of help for daily chores if sick, availability of help for dealing with personal problems, and whether or not others are available to exchange loving emotions. All items were rated on a 1–5 point scale ranging from "none of the time" to "all of the time".

2.3. Statistical analysis

We first examined the frequency of suicide risk variables including passive suicidal ideation, thoughts of suicide in the past month, and history of suicide attempts. Each potential explanatory variable was also correlated with total suicide risk score. A hierarchical multiple regression analysis was utilized to describe the association between suicide risk variables and potential explanatory variables. Mental health variables were entered in the first step, followed by physical health variables, and social support was entered in the final step. To adjust for multiple comparisons the critical value was set to $p < 0.01$. For this regression, continuous explanatory variables were dichotomized by comparing those who were one standard deviation above the mean to the remainder of the group (because social support is scored in the reverse direction to other measures, individuals one standard deviation below the mean were compared to the others).

3. Results

3.1. Frequency of suicidal thoughts and behaviors

Table 2 presents the percentage of individuals endorsing each suicide risk variable question. Results revealed that approximately 26% of patients endorsed passive suicidal ideation while 16% endorsed thoughts of suicide in the last month. Eighteen percent endorsed a history of suicide attempts; number of lifetime attempts in the total sample ranged from 0 to 30 with an average of 1.9 (SD=2.5).

3.2. Bivariate associations with suicide risk score

Table 3 presents bivariate correlations between presence of MDD and SUDs, continuous measures of symptom severity, SDS, PCS, EQ-5D pain, and medical conditions and suicide risk score. With the exception of SUDs, all were significantly associated with the suicide risk score. The magnitude of these correlations indicated small associations between each of these variables and the suicide risk score (based on the guidelines of small $r=0.1$, medium $r=0.30$, large $r=0.5$ established by Cohen (1988) and Hemphill (2003)).

3.3. Regression analysis of suicide risk score

Hierarchical linear regression was used to examine the relationship between suicide risk score and our set of explanatory variables. Table 4 presents results from these analyses. Significant mental health variables included MDD and mental health-related disability. Addition of the physical health variables did not explain additional variance in the model. Social support significantly and independently accounted for variance in suicide risk score.

Table 1
Baseline demographic variables.

	Number of participants (percentage)
Race	
Hispanic	195 (19)
Black	115 (12)
White	568 (57)
Other	124 (12)
Years of education[a]	
Less than 12 years	54 (5.4)
12 Years	165 (16.5)
More than 12 years	781 (77.9)
Gender	
Female	713 (71.2)
Male	289 (28.8)
Mean age	43.5 (13.5)

Note: the table represents N in each cell for race, mean years of education, and gender. Cells represent means and standard deviation for age. The table represents data from the sample of 1002 eligible study participants.

[a] Education data missing for one patient.

Table 2
Percent of sample endorsing items from MINI suicide risk module.

Item	% Of total sample endorsing (N=1620)	% Of enrolled sample endorsing (N=1002)
Think that you were better off dead or wish you were dead?	26.2	25.3
Want to harm yourself or to hurt or injure yourself?	6.4	5.1
Think about suicide?	15.6	13.4
Have a suicide plan?	2.5	1.3
Take any active steps to prepare to injure yourself or to prepare for a suicide attempt in which you expected or intended to die?	< 1	< 1
Deliberately harm or injure yourself?	4.1	2.2
Attempt suicide (past month)?	< 1	< 1
In your lifetime did you ever make a suicide attempt?	18.3	17.8

Note: the table represents data from the full sample of 1620 participants assessed for study eligibility as well as the sample of 1002 eligible study participants.

Table 3
Bivariate correlations between mental health, physical health, and social support variables and suicide risk score.

Measure	1	2	3	4	5	6	7	8	9
1. SUD	1.00								
2. MDD	0.04	1.00							
3. BSI	0.04	0.29***	1.00						
4. SDS	0.02	0.41***	0.54***	1.00					
5. PCS	0.07	−0.20***	−0.19***	−0.20***	1.00				
6. EQ5D-pain	−0.03	0.24***	0.26***	0.25***	−0.57***	1.00			
7. Medical conditions	−0.06	0.16***	0.16***	0.12***	−0.51***	0.40***	1.00		
8. MOS-SSS	0.003	−0.18***	−0.14***	−0.21***	0.19***	−0.17***	−0.17***	1.00	
9. Suicide risk score	0.07	0.21***	0.21***	0.22***	0.17***	0.17***	0.11**	−0.14***	1.00

Note: SUD/MDD: presence of a substance use disorder or major depressive disorder; BSI-12: Brief Symptom Inventory-12 (Derogatis and Savitz, 2000), anxiety and somatization subscales, SDS: Sheehan Disability Scale (Sheehan et al., 1996); PCS: 12-item short form Heath Survey version 2 (Ware et al., 2002); EQ5D-pain: pain item of the EQ-5D (EuroQol Group, 1990); MOS-Social Support Scale (MOS-SSS; Sherbourne and Stewart, 1991). For dichotomous variables (SUD, MDD) correlations represent point-biserial correlations. Table represents data from the sample of 1002 eligible study participants.

** $p < 0.01$.
*** $p < 001$.

Table 4
Hierarchical regression analyses predicting suicide risk score from mental health, physical health, and social support variables.

Variable	Suicide risk score			
	B	SE B	β	ΔR²
Step 1				0.08***
SUD diagnosis	0.95	0.42	0.07	
MDD diagnosis	1.18	0.25	0.15***	
BSI-12	0.83	0.32	0.09**	
SDS	1.43	0.34	0.14***	
Step 2				0.01
SUD diagnosis	1.04	0.42	0.08	
MDD diagnosis	1.08	0.25	0.14***	
BSI-12	0.71	0.32	0.07	
SDS	1.29	0.34	0.13***	
PCS	−0.07	0.32	−0.01	
GD5D-Pain	0.85	0.39	0.07	
Medical conditions	0.08	0.06	0.05	
Step 3				0.01**
SUD diagnosis	1.05	0.42	0.08	
MDD diagnosis	1.02	0.25	0.13***	
BSI-12	0.70	0.32	0.07	
SDS	1.25	0.34	0.12***	
PCS	−0.03	0.32	−0.003	
GD5D-Pain	0.84	0.38	0.07	
Medical conditions	0.06	0.06	0.03	
MOS-SSS	−0.83	0.28	−0.09**	

Note: SUD/MDD: presence of a substance use disorder or major depressive disorder; BSI-12: Brief Symptom Inventory-12 (Derogatis and Savitz, 2000), anxiety and somatization subscales, SDS: Sheehan Disability Scale (Sheehan et al., 1996); PCS: 12-item short form Heath Survey version 2 (Ware et al., 2002); EQ5D-pain: pain item of the EQ-5D (EuroQol Group, 1990); MOS-Social Support Sale (MOS-SSS; Sherbourne and Stewart, 1991). BSI-12, SDS, PCS, EQ-5D and MOS-SSS are dichotomous variables representing those above one standard deviation above the mean and those below (1SD below the mean vs. above for MOS-SSS). Table represents data from the sample of 1002 eligible study participants.

** $p < 0.01$.
*** $p < 0.001$.

4. Discussion

Results of the present study suggest that suicidal thoughts and behaviors are common among patients with anxiety disorders referred from primary care settings. Passive suicidal ideation was most common among these patients, with over one quarter of the sample endorsing thoughts of death in the past month. Moreover, 16% endorsed thoughts of suicide within the last month and 18% had attempted suicide at some point in their lifetime. These percentages are significantly higher than those observed in population studies (Kessler et al., 1999) and closely approximate those from studies of other anxious samples (Weissman et al., 1989; Cox et al., 1994; Tarrier and Gregg, 2004; Huang et al., 2010). Although individuals who were screened for participation in the randomized controlled trial had a relatively lower prevalence of suicidal thoughts and behaviors, prevalence rates for many of the suicide related items were very similar. Thus, although patients were referred from a primary care setting, the level of presenting suicidal ideation and behavior appears similar to individuals in outpatient mental health care settings.

Examination of individual explanatory variables indicated that although all variables but SUDs were significantly correlated with suicide risk score, the magnitude of these correlations was small. Thus, it appears that these variables individually are relatively weak predictors of suicide risk score. When examining independent variables simultaneously within a linear regression model, mental health variables including presence of MDD and greater mental health-related disability predicted suicide risk score. Physical health factors were not associated with suicide risk score when controlling for mental health, but social support was a significant independent variable in the model. However, the incremental variance explained by adding social support to the model was small (1%). It is also important to note that overall these variables accounted for a relatively small proportion of the variance in overall suicide risk score (approximately 10%). In conjunction with the relatively weak associations found in the correlational analysis, these data suggest that other factors that were not assessed contribute substantially to overall suicide risk score. Nonetheless, these relationships are generally consistent with an established body of literature indicating that mental health factors, including comorbid conditions and disability, are related to suicide risk in individuals with anxiety disorders (Noyes et al., 1991; Lepine et al., 1993; Warshaw et al., 1995, 2000; Freeman and Moore, 2000; Huang et al., 2010). The replication of these relationships in the present sample suggests that these patterns generalize to individuals with an anxiety disorder presenting in primary care.

In contrast to prior literature (e.g., Braden and Sullivan, 2008, Ilgen et al., 2008), the hypothesized physical health factors did not emerge as independently associated with suicide risk score. Comparing bivariate correlations to the regression analysis suggests that mental health comorbidity may partially account for associations observed between physical health variables and suicide risk score. Alternatively, the measurement of physical health problems may have led to the discrepant findings. Prior studies have found that specific disorders (Goodwin et al., 2003; MacLean et al., 2011) are predictive of suicide risk. If these

associations are specific to certain disorders then summing the number of disorders or assessing health status more generally might not adequately capture these relationships. Given that only one published study has examined physical conditions and suicide within individuals with an anxiety disorder (Freeman and Moore, 2000), further study is needed to determine association between these conditions and suicide risk in individuals with anxiety disorders, particularly in those referred from primary care settings. In addition, SUDs were not significantly associated with suicide risk scores in this sample. This is likely due to the exclusion of individuals with addiction problems other than alcohol or marijuana, suggesting that relatively mild use of marijuana and alcohol (below the level of dependence) may not be associated with increased suicide risk.

A number of limitations warrant considering in interpreting these results. First, the study did not assess all potentially relevant comorbid conditions. For example, the present analyses did not include any assessment of personality disorders. Extant literature indicates that these disorders increase suicide risk in patients with anxiety disorders and should thus be included in future research in this area (Nepon et al., 2010). Second, although descriptive data on suicide risk factors was available for a large sample of participants, examination of suicide risk score explanatory variables was done only with individuals enrolled in the clinical trial who met inclusion criteria. Thus, generalizability of this part of the results is limited to this type of population. In addition, data was collected cross-sectionally. Consequently, conclusions about directionality of these relationships or the temporal course of suicidal thoughts and behaviors and mental and physical health, disability, and social support variables cannot be made. Finally, suicide risk score was utilized as a proxy for suicidal behaviors, but risk score did not translate into attempted or completed suicide in this sample. Given that the current study is limited by the lack of serious suicidal behaviors, future work examining factors associated with suicide attempts and completions in a longitudinal design would provide further information about key predictors to target in suicide prevention efforts.

The present study highlights the relatively high rates of suicidal thoughts and past suicidal behaviors in individuals referred from a primary care setting. Risk may be particularly high in the context of comorbid MDD and functional impairment and low social support. However, future work is needed to determine other potential variables that may impact suicide risk score given that general mental health, physical health, and social support factors appear to play a relatively small role in overall suicide risk scores. While suicide assessment for individuals with MDD has become more commonplace, findings point to the additional need for suicide screening and intervention for individuals with anxiety disorders, particularly those with low occupational and social functioning. Thus, this type of clinical evaluation should also consider level of disability rather than simply diagnostic evaluation. Consideration of impairments in daily activities due to mental health symptoms, as well as the degree of isolation and social support available to patients, may provide critical information about level of risk in primary care samples.

In summary, suicidal ideation and past suicidal behavior were relatively common in this sample of primary care patients with one or more anxiety disorders. Findings are consistent with literature in specific anxious populations suggesting that individuals with greater burden of mental illness in terms of mood disorder comorbidity and impairment as well as relatively low social support are more likely to endorse suicidal ideation and behavior. Findings highlight the importance of suicide risk assessments in this type of patient, and suggest that consideration of depression, disability, and social support may be important for risk management.

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