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#### Research report

## Predictors of suicidal ideation among depressed veterans and the interpersonal theory of suicide



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#### ABSTRACT

*Background:* We assessed whether key constructs of the interpersonal theory of suicide were associated with suicidal ideation in depressed US Veterans.

Methods: 443 patients of the Veterans Health Administration diagnosed with a depressive disorder completed the Beck Depression Inventory, Interpersonal Support Evaluation List, and Beck Hopelessness Scale, from which we derived measures of burdensomeness, belongingness, and hopelessness consistent with the interpersonal theory of suicide. Measures of active and passive suicidal ideation were constructed from the Beck Suicide Scale and Beck Depression Inventory obtained at baseline and 3-months follow-up. Multivariable logistic regression was used to identify predictors of passive and active suicidal ideation while adjusting for demographic characteristics and somatic-affective symptoms of depression (e.g., anhedonia, insomnia).

Results: Burdensomeness and hopelessness were significantly associated with passive suicidal ideation at baseline and 3 months follow-up, but belongingness and the interaction between belongingness and burdensomeness were not significant predictors as proposed by the interpersonal theory of suicide. Somatic-affective depressive symptoms, but not any of the main effects predicted by the interpersonal theory of suicide or their interactions, were associated with active suicidal ideation at baseline. No factors were consistently associated with active suicidal ideation at 3 months follow-up.

*Limitations:* The measure of burdensomeness used in this study only partially represents the construct described by the interpersonal theory of suicide.

*Conclusion:* We found little support for the predictions of the interpersonal theory of suicide. Hopelessness appears to be an important determinant of passive suicidal ideation, while somatic-affective depression symptoms may be a key contributor to active suicidal ideation.

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#### 1. Introduction

Among psychiatric conditions, mood disorders are particularly associated with an increased risk for suicidal behaviors (Kessler et al., 1999). Suicide is the 10th leading cause of death in the US across all age groups (Centers for Disease Control and Prevention (CDC), 2010). For every suicide death there are as many as 25 nonfatal suicide attempts resulting in over 300,000 emergency department visits and nearly 200,000 hospitalizations annually (CDC, 2011). Despite public health and health care provider efforts

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to prevent suicide, overall suicide rates in the US have not substantially improved over the past decade, and rates among middle-aged Americans have increased (CDC, 2013). New suicide prevention interventions are needed, with intervention development being informed by a comprehensive understanding of the risk factors that lead to suicidal ideation and behaviors.

There are over a dozen well-established risk factors for suicide (Nock et al., 2008), which creates a challenge for clinicians and researchers trying to understand how these many factors affect overall suicide risk for individuals with more than one of these characteristics. The interpersonal theory of suicide (ITS) proposed by Joiner et al. has been widely cited and provides a testable model for how various suicide risk factors relate to one another and what combinations of risk factors lead to a desire for suicide and to suicide attempts (Van Orden et al., 2010). The ITS proposes that a wish to be

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dead (i.e., passive suicidal ideation) occurs when individuals experience both thwarted belongingness (e.g., poor social support, loneliness, interpersonal conflict) and perceived burdensomeness (e.g., self-hate, liability to others). A desire for suicide (i.e., active suicidal ideation) is posited to develop when individuals additionally experience hopelessness regarding their state of thwarted belongingness and burdensomeness. Suicide attempts occur when all of these conditions are met and the individual has additionally acquired a capacity for suicide (e.g., lowered fear of death or increased pain tolerance). A general population study provided support for the overall ITS constructs, with the model that incorporated the above constructs explaining a greater portion of the variance in subsequent suicidal ideation and behaviors than traditional risk factor models consisting of demographic characteristics (e.g., age, sex) and psychiatric diagnoses or symptoms (Christensen et al., 2013). However, some of the critical interactions between constructs hypothesized by the theory were not found in the general population study or in a study of Veterans with posttraumatic stress disorder (Christensen et al., 2013; Monteith et al., 2013). The ITS may require further modification if the proposed relationships are not consistently replicated.

To further test the utility of the ITS in predicting suicidal ideation, we obtained measures of social support (representing belongingness), self-hate (representing burdensomeness), hopelessness, and suicidal ideation in a sample of depressed Veterans. The following hypotheses derived from the ITS were tested:

- Belongingness, burdensomeness, and their interaction are independently associated with *passive* suicidal ideation after adjusting for demographic characteristics, hopelessness, and other somatic-affective depression symptoms.
- The three-way interaction between belongingness, burdensomeness, and hopelessness is independently associated with active suicidal ideation, after adjusting for demographic characteristics and other depression symptoms.
- Among patients with some suicidal ideation, hopelessness is an independent predictor of active vs. passive suicidal ideation, after adjusting for burdensomeness, belongingness, demographic characteristics, and other depression symptoms.

We examined the above hypotheses in cross-section and at 3-months follow-up because the utility of the theory would be strengthened if baseline factors could predict subsequent suicidal ideation.

#### 2. Methods

#### 2.1. Sample

Participants were Veterans Health Administration (VHA) patients who were enrolled in a clinical trial of a mutual peer support intervention for depression. The current study used participants' baseline data prior to receipt of the intervention except for suicidal ideation at 3 months follow-up, which did not differ between those who did or did not receive the intervention. Eligible participants were patients receiving mental health treatment with a diagnosis of depression (major depressive disorder [MDD], dysthymic disorder, bipolar II disorder, or depression not otherwise specified) who were currently depressed (Patient Health Questionnaire [PHQ-9] score ≥ 10 (Kroenke et al., 2001)) or functionally impaired (Work and Social Adjustment Scale score  $\geq$  10 (Mundt et al., 2002)) and had at least one prior antidepressant or psychotherapy trial. Patients were excluded if they were diagnosed with a psychotic disorder diagnosis (including MDD with psychosis) or bipolar I disorder in the past 24 months, substance dependence in the past 12 months, or substance abuse in the past 6 months. Participants were recruited from 15 different Midwestern VHA clinic sites. Of 7476 patients with a recorded diagnosis of depression who were screened by medical record review, 3131 met initial eligibility criteria. We obtained approval to recruit 1810 of these patients from their treating mental health clinician, of whom 617 declined to participate, 352 were ineligible upon further review, 378 were unable to be contacted, and 20 were still pending enrollment when recruitment ended. 443 eligible patients enrolled in the study and completed initial baseline assessments. The study was conducted with approval from each respective facility's institutional review board.

#### 2.2. Measures

Active suicidal ideation and passive suicidal ideation, the primary dependent variables, were determined from responses on the Beck Depression Inventory II (BDI-II) and Beck Suicide Scale (BSS) based on the descriptions of active vs. passive suicidal ideation by Joiner et al. and a prior study which categorized suicidal ideation using these measures (Szanto et al., 1996; Van Orden et al., 2010; Beck et al., 1996, 1988). Active suicidal ideation was considered present if the patient endorsed "I would like to kill myself" or "I would kill myself if I had the chance" on the BDI-II or "I have a weak desire to kill myself" or "I have moderate to strong desire to kill myself" on the BSS. Passive suicidal ideation was considered present if active suicidal ideation was not present and if the participant endorsed "I have a weak wish to die", "I have a moderate to strong wish to die", "My reasons for dying outweigh my reasons for living", or "I would not take the steps necessary to avoid death if I found myself in a life-threatening situation" on the BSS or "I have thoughts of killing myself, but I would not carry them out" on the BDI-II.

Hopelessness was assessed using the Beck Hopelessness Scale (BHS), which consists of 20 true-false items assessing patients' negative attitudes about the future (Beck and Steer, 1988). The scale is scored from 0 to 20 with higher scores indicating greater hopelessness. In addition to the original studies conducted by Beck et al., a subsequent meta-analysis has confirmed the BHS is a highly sensitive measure with reasonable specificity for predicting future suicidal behaviors (McMillan et al., 2007; Beck et al., 1990, 1985).

Social support, representing the ITS construct of belongingness, was assessed using the Interpersonal Support Evaluation List (ISEL), a 40-item measure which assesses perceived social support along four domain subscales: tangible support (someone to provide material aid), appraisal support (someone to talk to about personal or important issues), self-esteem support (someone with whom the individual compares favorably to), and belonging support (being part of a group) (Cohen et al., 1985). Each item is scored from 0 to 3 for a scale range from 0 to 120 with higher scores indicating greater belongingness. Confirmatory factor analysis has demonstrated the validity of the subdomains as well as a global social support factor represented by the total score (Brookings and Bolton, 1988). The ISEL has moderate to high correlation with a measure of belongingness (but not burdensomeness) constructed by Joiner et al., (Van Orden et al., 2012).

Self-hate, representing the ITS construct of burdensomeness, was assessed by the items from the cognitive subscale of the BDI-II which addressed feelings of past failure, guilt, punishment, self-dislike, self-criticism, and worthlessness (Steer et al., 1999; Beck et al., 1996). Based on six items with four responses each (0 to 3), the burdensomeness measure had a range from 0 to 18 with higher scores indicating greater burdensomeness.

Somatic-affective depression symptoms were assessed using a separate BDI-II subscale that included items for sadness, anhedonia, agitation, irritability, fatigue, problems concentrating, changes in appetite, and changes in sleep. The subscale included 13 items with four responses each (0 to 3) for a range from 0 to 39 with higher

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