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Relationship of optimism and suicidal ideation in three groups of patients at varying levels of suicide risk

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ABSTRACT

Optimism has been associated with reduced suicidal ideation, but there have been few studies in patients at high suicide risk. We analyzed data from three study populations (total N = 319) with elevated risk of suicide: (1) patients with a recent acute cardiovascular event, (2) patients hospitalized for heart disease who had depression or an anxiety disorder, and (3) patients psychiatrically hospitalized for suicidal ideation or following a suicide attempt. For each study we analyzed the association between optimism (measured by the Life–Orientation Test-Revised) and suicidal ideation, and then completed an exploratory random effects meta-analysis of the findings to synthesize this data. The meta-analysis of the three studies showed that higher levels of self-reported optimism were associated with a lower likelihood of suicidal ideation (odds ratio [OR] = .89, 95% confidence interval [CI] = .85–.95, $z = 3.94$, $p < .001$), independent of age, gender, and depressive symptoms. This association held when using the subscales of the Life Orientation Test-Revised scale that measured higher optimism (OR = .84, 95% CI = .76–.92, $z = 3.57$, $p < .001$) and lower pessimism (OR = .83, 95% CI = .75–.92], $z = 3.61$, $p < .001$). These results also held when suicidal ideation was analyzed as an ordinal variable. Our findings suggest that optimism may be associated with a lower risk of suicidal ideation, above and beyond the effects of depressive symptoms, for a wide range of patients with clinical conditions that place them at elevated risk for suicide.

Suicide is a major public health problem (e.g., Fleischmann and De Leo, 2014) and is responsible for 800,000 deaths worldwide each year (World Health Organization, 2014). Given the prevalence of suicide, much attention has been paid to identifying suicide risk factors, including specific demographic (e.g., age), social (e.g., unemployment), medical (e.g., pain), and psychological characteristics (e.g., psychosis; Hawton and van Heeringen, 2009). Among these risk factors, one of the most consistent findings is that individuals with chronic medical and psychiatric conditions have a substantially elevated risk of suicide (Hawton and van Heeringen, 2009; Kishi et al., 2001).

Along with identifying risk factors for suicide, however, it is critical to identify factors that may mitigate the risk of suicide (Knox et al., 2004; Wingate et al., 2006). Recent investigations suggest that some factors such as social support (Hirsch and Barton, 2011), meaning in life (Kleiman and Beaver, 2013), and positive affect (Hirsch et al., 2009) are associated with fewer suicidal thoughts and behaviors. Preliminary research regarding optimism (defined as generalized expectations for a positive future) consistently indicates that it is also inversely related to suicidal thoughts and behaviors (Bryan et al., 2013; Chang et al., 2013; Hirsch et al., 2007; O'Keefe and Wingate, 2013).

The beneficial effects of optimism on suicidal ideation may be distinguished from the adverse effects of depression and hopelessness. Low optimism is not synonymous with the presence of depression and hopelessness (Glanz et al., 1995; Rasmussen et al., 2009), and it may be a more durable trait (Glanz et al., 1995;

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Rasmussen and Wingate, 2011). Furthermore, empirical studies have found that optimism's association with fewer suicidal thoughts has been independent of the effects of depression and hopelessness (Hirsch et al., 2007; O'Connor et al., 2008). Hirsch et al. (2007) found that among young college students, optimism was significantly associated with lower suicidal ideation on multivariable analysis including depression and hopelessness, and O'Connor et al. (2008) similarly found that positive future thinking was associated with lower risk for subsequent suicidal ideation, independent of depression, hopelessness, and baseline suicidal ideation in a population of patients hospitalized for suicidal self-harm.

To date, most investigations of the association between optimism and suicidal thoughts have studied young, healthy participants (Hirsch et al., 2006). Few studies regarding optimism's association with suicide have included patients with medical or psychiatric conditions, a cohort at elevated risk for suicide (Amer and Hamdan-Mansour, 2014; Hawton and van Heeringen, 2009). Accordingly, we separately examined the association between optimism (measured via the Life Orientation Test-Revised [LOT-R]; Scheier et al., 1994) and suicidal ideation in three different study populations with elevated risk for suicide. These included a largely psychologically healthy population of patients with heart disease, a group of cardiac patients with mood or anxiety disorders, and a set of medically healthy patients who were hospitalized for suicidal ideation or attempted suicide. We assessed the connection between optimism and suicidal ideation in each cohort controlling for age, gender, and depressive symptoms. We then combined the findings from the three individual analyses in an exploratory meta-analysis. We hypothesized that greater optimism would be associated with lower suicidal ideation, independent of age, gender, and depression, across all three of these at-risk populations that have rather different overall risk for suicide.

1. Methods

1.1. Overview

This analysis examined a total of three studies, individually and via meta-analysis. All three studies in this report were carried out in accordance with the latest version of the Declaration of Helsinki, Institutional Board Review approval was obtained prior to study initiation, and written informed consent was obtained from all participants.

Study 1 was the Gratitude Research in Acute Coronary Events (GRACE) study (clinicaltrials.gov identifier NCT: 01709669), a 6-month observational study enrolling participants between September 2012 and January 2014. The GRACE study examined the impact of psychological constructs (e.g., optimism, gratitude) on subsequent outcomes (e.g., biomarkers, health behaviors, and rehospitalization) in patients with acute cardiac illness; methods and results have been described in detail elsewhere (Huffman et al., 2015, 2016).

Study 2 was the Management of Sadness and Anxiety in Cardiology (MOSAIC) trial (clinicaltrials.gov identifier NCT: 01201967), a randomized controlled trial of a depression and anxiety collaborative care management intervention that enrolled patients who were hospitalized for acute cardiac illness at an urban academic medical center between September 2010 and December 2012. Participants were randomized to 24 weeks of the multipronged collaborative care intervention (utilizing a social work care manager to coordinate care) or to treatment as usual. Methods and main study results have been described in detail elsewhere (Huffman et al., 2013, 2014b).

Study 3 was the Longitudinal Assessment of Positive States (LAPS) Study (clinicaltrials.gov identifier NCT: 01398891), a prospective observational study of 44 adults who were enrolled during hospitalization for suicidal thoughts or behavior between May 2011 and February 2013. Participants' psychological status was measured via self-report assessments over 8 weeks.

After examining the relationship between optimism and suicidal ideation in each study, we performed an exploratory meta-analysis to synthesize the effects of optimism on suicidal ideation across these samples. Random effects models were used to examine associations between the LOT-R scale and suicidal ideation as measured by relevant items on scales used in the above studies; analyses were repeated using the LOT-R subscales.

1.1.1. Study 1 (GRACE)

1.1.1.1. Participants and procedures. Participants were patients who had been admitted to an urban academic medical center for an acute coronary syndrome (ACS), defined as myocardial infarction or unstable angina. Study exclusion criteria included an ACS occurring in the setting of another medical procedure, a comorbid terminal medical condition, inability to complete physical activity, and cognitive deficits diagnosed by a 6-item screening test (Callahan et al., 2002). As part of study procedures, self-report measures were administered at 2 weeks, 3 months, and 6 months after discharge. Participants' baseline sociodemographic and medical characteristics were collected via patient self-report at enrollment and medical record review

1.1.2. Measures

Dispositional optimism was assessed using the well-validated 6-item LOT-R. Example items include the positively worded "I expect more good things to happen to me than bad" and the negatively worded "I hardly ever expect things to go my way." Participants responded to each item with the following scale: 4 = *agree a lot*, 3 = *agree a little*, 2 = *neither agree nor disagree*, 1 = *disagree a little*, and 0 = *disagree a lot*. Per convention (Scheier et al., 1994), a total optimism score was computed by reverse-scoring the negatively-worded items and summing the responses of all six items. The LOT-R has previously demonstrated acceptable convergent and discriminant validity (Scheier et al., 1994). The internal consistency of the LOT-R in the Study 1 sample ($\alpha = .85$) was good, consistent with its demonstrated reliability in other samples (Scheier et al., 1994). In addition to the total optimism scale, the LOT-R contains two embedded 3-item optimism and pessimism subscales, with higher scores on each subscale representing higher optimism and lower pessimism, respectively. In our sample, Cronbach's alpha for the optimism subscale ($\alpha = .75$) and pessimism subscale ($\alpha = .83$) were similar to previous estimates of reliability for each subscale (Vassar and Bradley, 2011).

Depression was measured using the first eight items (PHQ-8) of the nine-item Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 asks about the nine core symptoms (each scored 0–3) of depression (American Psychiatric Association, 2013). For each item (e.g., "Trouble concentrating on things, such as reading the newspaper or watching television"), respondents were asked to report whether they had experienced the symptom "not at all" "several days," "more than half of the days," or "nearly every day" over the past two weeks. The PHQ-9 has been validated in medical populations (Kroenke et al., 2001), and its use is recommended by the American Heart Association to assess depression (Lichtman et al., 2008). The eight-item PHQ-8 (all depression items except suicidal ideation) is increasingly used in clinical settings as a stand-alone measure of depression. The PHQ-8 has itself been validated in large population-based cohorts (Kroenke et al., 2009; Wells et al., 2013) as well as in patients with coronary artery disease (Razykov et al., 2012) and heart failure (Pressler et al., 2011). In this and all