FUTURE ORIENTATION MODERATES THE RELATIONSHIP BETWEEN FUNCTIONAL STATUS AND SUICIDE IDEATION IN DEPRESSED ADULTS

Jameson K. Hirsch, Ph.D.,1,2* Paul R. Duberstein, Ph.D.,1 Kenneth R. Conner, Psy.D., M.P.H.,1 Marnin J. Heisel, Ph.D.,1,3 Anthony Beckman, B.S.,1 Nathan Franus, M.S.,1 and Yeates Conwell, M.D.1

Functional impairment might amplify suicide risk in later life. A positive view of the future may reduce this risk. We tested the hypothesis that hopelessness and positive future orientation moderate the association between functional status and suicide ideation in a sample of 136 patients, 55 years of age or older, in treatment for depression. Future orientation moderated the association between functional status and suicide ideation; hopelessness did not. Although prospective research is needed to test more rigorously the hypothesized protective role of positive future orientation, our data suggest that treatments designed to enhance future orientation might decrease suicide risk. Depression and Anxiety 24:196–201, 2007. Published 2006 Wiley-Liss, Inc.

Key words: future orientation; functional status; suicide ideation

INTRODUCTION

Suicide is a significant public health problem for adults ages 55 and over [U.S. Public Health Service, 1999]. A large majority of suicides in this age group have a diagnosable mental illness at time of death, particularly mood disorders [Conwell et al., 2002]. Given that physical illness and impaired functional status may amplify risk for suicidal thoughts and behaviors in depressed patients [Conwell et al., 2000; Juurlink et al., 2004; Leibenluft and Goldberg, 1988], it is important to gain a better understanding of how such risk might be mitigated [Chochinov et al., 1997].

Cognitive theories and treatments suggest that risk-reduction could be accomplished by reducing maladaptive, negative cognitions [Szanto et al., 2001]. “Hopelessness,” defined as a negative outlook toward the future, is associated with poor outcomes, including suicide ideation, attempts, and mortality in both psychiatric and medical samples [Barefoot et al., 2000; Beck et al., 1990; Chochinov et al., 1997]. “Positive future orientation,” (FO) defined as a predisposition to think about and have a positive mood about the future and to strive toward achievement of identified goals, is related to enhanced well-being, better psychological adjustment, and reduced depression in patients with arthritis, HIV, multiple sclerosis, and Parkinson’s disease [Downe-Wamboldt and Melanson, 1995; Ridder et al., 2000; Safren et al., 2002]. Positive FO may decrease suicide risk among patients with other risk factors [Linehan et al., 1983; Ormel et al., 1997].

Cross-sectional research has documented a relationship between functional impairment and depressive

1Center for the Study and Prevention of Suicide, Department of Psychiatry, University of Rochester School of Medicine and Dentistry, Rochester, New York
2Department of Psychology, Rochester Institute of Technology, Rochester, New York
3Department of Psychiatry and Department of Epidemiology and Biostatistics, Schulich School of Medicine and Dentistry, The University of Western Ontario, London, Ontario, Canada

Contract grant sponsor: U.S. Public Health Service; Contract grant number: T32MH20061, R01MH064579, and R01MH60285.

*Correspondence to: Jameson K. Hirsch, Ph.D., Department of Psychology, Rochester Institute of Technology, 18 Lomb Memorial Drive, Rochester, NY 14623. E-mail: jkhgla@rit.edu

Received for publication 18 October 2005; Revised 21 March 2006; Accepted 7 April 2006
DOI 10.1002/da.20224
Published online 7 August 2006 in Wiley InterScience (www.interscience.wiley.com).

1This article is a US Government work and, as such, is in the public domain in the United States of America.
symptoms, and suicide ideation in older patients [Friedman et al., 2005]. Prospective studies suggest that this relationship is bidirectional, because depression amplifies functional impairment [Alexopoulos et al., 2005; Bruce et al., 1994], and functional impairment amplifies depression [Ormel et al., 2002].

Prognosis for depressed, functionally impaired patients includes risk of further functional decline, poor quality of life, and increased use of health care services [Jaffe et al., 1994; Paykel et al., 1995].

Although impaired functional status is associated with increased risk for suicidal thoughts and behaviors in older adults, poor outcomes are not inevitable. For instance, despite functional limitations, those who view their future in a positive manner may receive psychological benefits, and are thus less likely to consider suicide; in contrast, a person experiencing high levels of hopelessness may be unable to do so. Our study focused specifically on depressed patients given that mood disorders have been shown to increase risk for suicidal behavior in older adults [Conwell et al., 2002].

The development of targeted treatment and prevention programs requires a deeper understanding of why some depressed patients report thoughts of suicide and others do not. We hypothesized that high levels of positive FO and low levels of hopelessness would moderate the relationship between functional status and current suicide ideation, after accounting for sociodemographic characteristics and severity of depressive symptoms.

METHODS

PARTICIPANTS

Depressed patients \( n = 136 \) were recruited from inpatient and outpatient services of three teaching hospitals in Rochester, New York, including a tertiary care facility, an academic medical center, and a community hospital. Recruitment and informed consent procedures have been described elsewhere [Heisel et al., 2006], and were subject to the review and approval of an Institutional Review Board. Psychiatric diagnoses were established using the Structured Clinical Interview for DSM-IV Axis I disorders [First et al., 1997]. One hundred eighteen (87%) patients were diagnosed with major depressive disorder (MDD): 45 with single-episode MDD, and 73 with recurrent MDD. Eighteen patients (13%) had bipolar disorder. We excluded patients with cognitive disorder, psychotic or delusional disorder, substance-induced mood disorder, and current psychotic depression. Patients with bipolar affective disorder were excluded if the most recent episode was manic or unspecified. Mean (standard deviation) age of participants was 66.55 (9.71), and their overall education level was 12.98 years \( (SD = 2.85) \). Fifty-seven patients (42%) were men, 130 (96%) were Caucasian, 61 (45%) lived alone, 43 (32%) were separated or divorced, and 102 (75%) were either retired or on disability.

MEASURES

Future orientation (FO). We created a measure of FO by selecting the following items from the Reasons for Living Inventory—Older Adults Version [Edelstein et al., 2000]: (1) “Tomorrow I may feel better”; (2) “No matter how badly I feel, I know it will not last”; (3) “I believe I can learn to adjust or cope with my problems”; (4) “I have coped before and I can do it again”; (5) “I have the hope that things will improve and the future will be happier”; and (6) “I have future plans I am looking forward to carrying out.”

Respondents rated each item on a Likert-scale according to how important it is in preventing them from taking their lives, from 1 (extremely unimportant) to 6 (extremely important); higher scores indicate greater FO. This FO scale showed high internal consistency in this sample \( (\alpha = .89) \) and significantly distinguished suicide ideators from nonideators [odds ratio (OR) = .92, 95% confidence interval (CI) = .88–.96, \( P < .001 \), Wald score = 14.48] and death ideators from patients not thinking of death (OR = .95, 95% CI = .90–.99, \( P < .05 \), Wald score = 5.31). In a previous study, FO scores distinguished between mild and severe worst-point suicide ideation, and between lifetime suicide attempters and nonattempters [Hirsch et al., 2006].

Beck Hopelessness Scale [Beck et al., 1974]. The BHS assesses negative attitudes about the future via 20 true–false statements, and is associated with suicide ideation in older adults [Heisel et al., 2002]. Mean hopelessness scores for our sample are comparable to other studies of older adult psychiatric patients [Lynch et al., 2003; Mann et al., 1999]; higher BHS scores indicate greater hopelessness.

Illness burden. Burden of physical illness, a covariate, was assessed utilizing the Cumulative Illness Rating Scale [CIRS; Linn et al., 1968], which provides a rating of illness burden in each of 13 organ systems, and is valid and reliable when used with older adults [Conwell et al., 1993]. As in prior studies [Duberstein et al., 2003], scoring was based on a physician’s review of medical history from health records and interviews; higher scores indicate greater illness burden.

Hamilton Rating Scale for Depression [HRSD; Williams, 1988]. The HRSD is a 24-item, interviewer-administered measure of the presence and severity of current depressive symptoms; higher scores indicate greater depression severity. The HRSD has adequate psychometric properties [Williams, 2001] and has been used extensively with clinical samples [Lyness et al., 1993]. HRSD scores for our sample were similar to other older adult inpatient samples [Soloff et al., 2000]. The HRSD served as a covariate in the analyses reported here; the HRSD item assessing suicide ideation was omitted to reduce collinearity with the dependent measure.

Instrumental Activities of Daily Living [LADL; Lawton and Brody, 1969]. This measure of functioning assesses nine tasks, including meal preparation,
telephone use, shopping, transportation, housework, finance management, and medication adherence. The IADL has well-established reliability and validity [Hokoishi et al., 2001], and is associated with suicide ideation in older adults [Awata et al., 2005]. IADL scores in our sample were comparable to those in other older adult studies [Callahan et al., 2005]. Higher IADL scores indicate higher levels of functional impairment.

**Scale for Suicide Ideation [SSI; Beck et al., 1979].** The main outcome variable in this study is suicide ideation, assessed via the SSI, a 19-item, observer-rated measure tapping suicide ideation, presence of a suicide plan, deterrents to suicidal behavior, preparations for a suicide attempt, and anticipation of attempting suicide. SSI scores are associated with risk of suicide attempt and completed suicide among mental health outpatients [Beck et al., 1997]. The mean for the current sample was 4.03 (SD = 7.88), and the internal consistency coefficient (Cronbach’s α) was .83. The SSI yields a single score; higher scores indicate greater severity of suicide ideation.

**STATISTICAL ANALYSES**

We conducted multivariate linear regression analyses to test whether positive FO and hopelessness moderate the association between functional status and current suicide ideation. Consistent with recommendations for conducting moderator analyses [Baron and Kenny, 1986], we entered covariates and predictors on the first step of the regression model and interaction terms on the second. Predictor variables were centered prior to creating interaction terms. Covariates were age, gender, depression severity, and medical morbidity. The interaction term between hopelessness and functional status was not significant; therefore, hopelessness and the hopelessness–functional status interaction term were removed from the final analytic model. To ensure that depression severity was not exerting a suppressive effect on hopelessness, we conducted additional analyses without covariate coverage of HRSD scores; the pattern of findings did not change (i.e., hopelessness remained nonsignificant). HRSD scores were retained in the final model reported in the text.

**RESULTS**

Hopelessness and FO were modestly associated with one another (r = −.20, P < .05), indicating that they could be entered into the analysis simultaneously (see Table 1 for bivariate correlations). Table 2 shows that FO moderated the relationship between functional status and current suicide ideation; the association between functional status and suicide ideation is weaker for patients with higher levels of FO (see Fig. 1). Hopelessness did not moderate the association between functional status and suicide ideation. An inverse relationship between age and suicide ideation was observed after controlling for covariates.

**DISCUSSION**

We found that FO moderated the association between functional status and suicide ideation, after we controlled for age, gender, depression severity, and illness burden. Although hopelessness has been shown to be associated with increased suicidal ideation in many studies [Szanto et al., 2002], negative findings

### TABLE 1. Frequencies and bivariate correlations of study variables

<table>
<thead>
<tr>
<th>Predictor</th>
<th>M (SD)</th>
<th>Range</th>
<th>Female</th>
<th>BHS</th>
<th>CIRS</th>
<th>IADL</th>
<th>HRSD</th>
<th>FO</th>
<th>Suicide ideation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>66.55 (9.71)</td>
<td>55–88</td>
<td>−.20*</td>
<td>−.16</td>
<td>.25**</td>
<td>.25**</td>
<td>−.20*</td>
<td>−.03</td>
<td>−.23**</td>
</tr>
<tr>
<td>Female [N(%)]</td>
<td>79 (58%)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>BHS</td>
<td>9.81 (6.15)</td>
<td>0–20</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>.22*</td>
<td>.24*</td>
<td>.33**</td>
<td>.23*</td>
</tr>
<tr>
<td>CIRS</td>
<td>6.28 (4.51)</td>
<td>0–21</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>.34**</td>
<td>.12</td>
<td>.20</td>
<td>.04</td>
</tr>
<tr>
<td>IADL</td>
<td>7.54 (7.68)</td>
<td>0–34</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>.38**</td>
<td>−.04</td>
<td>.20*</td>
</tr>
<tr>
<td>HRSD</td>
<td>25.38 (7.51)</td>
<td>8–44</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>−.22*</td>
<td>.24*</td>
</tr>
<tr>
<td>FO</td>
<td>23.20 (8.88)</td>
<td>6–36</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>−.28**</td>
</tr>
</tbody>
</table>

*P < .05; **P < .01.

**TABLE 2. Potential moderators of suicide ideation: multivariate regression analysis**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Current suicide ideation (SSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Step 1</td>
</tr>
<tr>
<td></td>
<td>t-value</td>
</tr>
<tr>
<td>Constant</td>
<td>3.21**</td>
</tr>
<tr>
<td>Age</td>
<td>−3.03**</td>
</tr>
<tr>
<td>Female</td>
<td>−.03</td>
</tr>
<tr>
<td>HRSD</td>
<td>.24</td>
</tr>
<tr>
<td>CIRS</td>
<td>−1.26</td>
</tr>
<tr>
<td>IADL</td>
<td>2.78**</td>
</tr>
<tr>
<td>Positive FO</td>
<td>−3.98***</td>
</tr>
<tr>
<td>IADL × positive FO</td>
<td>—</td>
</tr>
</tbody>
</table>

*P < .05; **P < .01; ***P < .001.
have been reported as well [Mendonca and Holden, 1996; Young et al., 1994]. In our sample, the nonsignificance of hopelessness may be due to shared variance with FO. The inverse association between age and suicide ideation is consistent with some [Duberstein et al., 1999] but not all [Szanto et al., 1996] research on age-restricted samples of patients with mood disorders.

Previous research suggests that functional impairment is a more robust marker of depression and suicidal ideation and behaviors than medical illness alone [Zeiss et al., 1996]. With increasing age, likelihood of functional decline also increases, potentially elevating suicide risk. Many depressed older adults, however, do not experience suicidal thoughts in the context of declines in health or function. Our findings suggest that depressed and functionally impaired patients who have a greater sense of FO have relatively lower levels of suicide ideation.

Although functional limitations increase risk for suicidal ideation and behaviors [Conwell et al., 2000], poor outcomes are avoidable. An individual with a positive outlook toward the future may reduce his or her distress and thereby lessen risk [Vaillant, 2003] despite experiencing functional impairment and depression. Higher levels of optimism are associated with improved physical and psychological outcomes in patients with chronic disease [Downe-Wamboldt and Melanson, 1998; Ridder et al., 2000], although negative findings have been reported [Schofield et al., 2004]. Achievement of identified goals may provide at-risk individuals with a reason to continue living, offering some protection from suicide risk [Linehan et al., 1983; Ormel et al., 1997].

Our findings have implications for the treatment of suicidal ideation and behavior in patients with physical illness and declines in functional status. Individuals with a positive FO appear to be protected from other unfavorable medical and psychological outcomes [Achat et al., 2000]. Because observational studies have shown that optimism is prospectively associated with increased well-being, and better health and recovery from cancer and cardiovascular illness [Carver et al., 1994; Kubzansky et al., 2001], interventions designed to promote optimism and help patients cultivate a positive FO may be important goals in efforts to reduce suicide ideation and behaviors in depressed, medically ill, and functionally impaired patients.

The relationships between suicide ideation and behavior, however, have yet to be fully defined; many people with thoughts of suicide do not act on them [Kessler et al., 1999], and some people will deny having thoughts of suicide prior to taking their lives [Fawcett et al., 1993]. In a study of suicide deaths in older adults, Waern et al. [1999] found that 38% expressed thoughts of suicide to a clinician, but 8% denied having suicidal
thoughts even when asked directly. Although past history of suicidal behavior is an important risk marker for suicide [Heisel and Duberstein, 2005], those who have never previously engaged in suicidal behavior nonetheless account for 58% [Rubenowitz et al., 2001] to 75% [Phillips et al., 2003] of deaths by suicide in older age. Although our data suggest that there is a relationship between FO and suicide ideation, the implications of FO for lethal and nonlethal self-harm are unknown.

The current novel and robust findings must be interpreted in the context of the study’s limitations. Generalizability to other demographic subgroups, nondepressed or untreated patients, and patients seen in primary and specialty medical care settings is unknown. We were unable to distinguish functional impairment occurring as a result of depression from impairment due to medical illness; however, we included depression severity and medical illness burden as covariates. Given the myriad influences on self-reported functional status, future research should also incorporate objective measures of function. Potential covariates (e.g., social support, type and duration of treatment) that are not included in our study might affect the association of functional status and suicide ideation, and should be examined in future research.

Prospective research suggests that a positive FO could confer benefits regardless of whether depression is contributing to functional impairment, or vice versa [Achat et al., 2000]. The cross-sectional design precluded us from examining this issue. Prospective research is needed to determine whether risk of suicidal thoughts and attempts are lower in medically ill or functionally impaired and depressed patients who have a positive FO. Investigation of the mechanisms by which FO might exert a protective effect is warranted, and any potentially harmful consequences of a positive FO on physical functioning need to be explored [Segerstrom, 2005]. Better understanding of factors that influence the development and expression of suicidal thoughts and behaviors may facilitate improved medical and functional outcomes.

Acknowledgments. We appreciate the assistance of Stephanie Gamble, Ph.D., Ben Chapman, Ph.D., Holly Wadkins, B.A., Patrick Walsh, B.A., and Madalina Chirieac, M.D.

REFERENCES


