

## Brief Report: Chronic Pain and the Interpersonal Theory of Suicide

**Keith G. Wilson,**

The Ottawa Hospital Rehabilitation Centre, Ottawa, Ontario, Canada

**John Kowal,**

The Ottawa Hospital Rehabilitation Centre, Ottawa, Ontario, Canada

**Peter R. Henderson,**

The Ottawa Hospital Rehabilitation Centre, Ottawa, Ontario, Canada

**Lachlan A. McWilliams,** and

University of Saskatchewan, Saskatoon, Saskatchewan, Canada

**Katherine Péloquin**

Université de Montréal, Montréal, Québec, Canada

### Abstract

**Objective**—Although chronic pain is a known risk factor for suicide, few studies to date have tested specific predictions about suicidal ideation that are derived from theory. The interpersonal theory of suicide proposes that the psychological constructs of thwarted belongingness and perceived burdensomeness are unique and independent precursors to suicidal ideation. We tested this hypothesis in a clinical sample of patients with chronic pain.

**Methods**—A total of 303 patients of a chronic pain rehabilitation program completed measures of pain severity, duration, and disability, cognitive-affective measures of depression and catastrophizing, and interpersonal measures of relationship distress and self-perceived burden to others. The latter measures were included as indices of the belongingness and burdensomeness constructs. Participants also rated two items pertaining to suicidal ideation.

**Results**—In a multiple regression analysis, both distress in interpersonal relations ( $\beta = 0.12, p = .037$ ) and self-perceived burden to others ( $\beta = 0.25, p < .001$ ) were significant predictors of suicidal ideation, even after adjusting statistically for demographic characteristics, pain severity and duration, functional limitations, catastrophizing, and depression.

**Conclusions**—These findings suggest that the interpersonal theory is relevant to understanding elevated rates of suicidal ideation among people with chronic pain and may have broader applicability to other populations with chronic illness or disability.

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Correspondence concerning this article should be addressed to Keith G. Wilson, Ph.D., The Ottawa Hospital Rehabilitation Centre, 505 Smyth Road, Ottawa, ON, K1H 8M2, Canada. kewilson@toh.on.ca.

Keith G. Wilson, John Kowal, Peter R. Henderson, Department of Psychology, The Ottawa Hospital Rehabilitation Centre, Ottawa, Ontario, Canada; Lachlan A. McWilliams, Department of Psychology, University of Saskatchewan, Saskatoon, Saskatchewan, Canada; Katherine Péloquin, Department of Psychology, Université de Montréal, Montréal, Québec, Canada.

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## Keywords

chronic pain; suicide; suicidal ideation; interpersonal theory; interdisciplinary treatment

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The interpersonal theory of suicide attempts to integrate various psychological and social risk factors for suicidal behavior into a general conceptual framework. It proposes that two factors – thwarted belongingness and perceived burdensomeness – combine to create the psychological context that leads to the desire to commit suicide (Joiner, 2005; Van Orden et al. 2010). Thwarted belongingness describes an unmet need for a basic sense of social connection, and is reflected in such problems as loneliness, withdrawal from others, and family conflict. Perceived burdensomeness is the individual's belief that he or she has become a source of hardship for others, who might actually be better off with the person gone (Van Orden et al., 2010; Van Orden, Cukrowicz, Witte, & Joiner, 2012).

Suicide rates are often elevated among medical patients and, compared to the general population, they are at least doubled among people with chronic pain (Tang & Crane, 2006). Importantly, there is growing interest in the interpersonal aspects of chronic pain problems, as reflected in studies of attachment (Meredith, Ownsworth, & Strong, 2008) and social engagement (Boonstra, Reneman, Stewart, Post, & Schipost Preuper, 2012), which are presumably relevant to the sense of belongingness. There are also studies of self-perceived burden to others, which is conceptually similar to perceived burdensomeness (Kowal, Wilson, McWilliams, Pélouin, & Duong, 2012). It is possible, therefore, that these dimensions explain aspects of suicidal behavior in chronic pain (Kanzler, Bryan, McGeary, & Morrow, 2012), beyond the contributions of putative risk factors that have already been identified, such as pain intensity and duration, depression, and pain catastrophizing (Edwards, Smith, Kudel, & Haythornthwaite, 2006; Tang & Crane, 2006).

Our knowledge of these risk factors comes largely from research that has examined correlates of suicidal ideation in individuals with chronic pain. To date, few studies have tested specific predictions that are derived from theory. In this study, therefore, we tested a central hypothesis of the interpersonal theory of suicide among people attending an interdisciplinary program for the management of chronic pain. Specifically, we examined whether measures of interpersonal relationships and self-perceived burden are unique and independent predictors of suicidal ideation, after adjusting for other presumed risk factors such as pain intensity, disability, and cognitive-affective measures of catastrophizing and depression.

## Method

### Participants

The participants were patients referred for interdisciplinary rehabilitation of chronic musculoskeletal pain problems. The pain management program and the research recruitment procedures have been described previously (Kowal, Wilson, Henderson, Geck, & D'Eon, 2011; Kowal et al., 2012). Briefly, the program is a group-based, outpatient, self-management intervention that is founded on cognitive-behavioral principles. In general,

patients are referred if they have continuing difficulties in coping with chronic pain and have exhausted medical alternatives that might offer a cure. During the recruitment period for this study, 328 patients entered the program and were asked to provide baseline data. The present sample comprised 303 individuals (92.4%) with complete information on all of the relevant measures (189 female). They had an average age of 47.4 years ( $SD = 10.24$ ). The sites of their primary pain complaints were diverse, and included back/neck (43.2%), widespread or multiple locations (28.7%), shoulders/limbs (14.9%), or other sites (13.2%). The participants had been experiencing chronic pain for an average of 7.03 years ( $SD = 7.78$ ).

## Procedure

This research was approved by the hospital research ethics review board, and all participants completed an acknowledgement of informed consent.

At program entry, each patient completed a battery of questionnaires. This included a pain history report, which recorded demographics and background information about the pain problem. The battery also contained measures of pain severity and disability, cognitive-affective dimensions of catastrophizing and depression, and interpersonal constructs of relationship distress and self-perceived burden. The internal consistency reliabilities of all measures were very good, and ranged from  $\alpha = 0.83$  to  $\alpha = 0.92$ .

## Measures

**Pain severity**—Using 11-point scales anchored at 0 (*no pain*) and 10 (*as intense as you can imagine*), participants rated their current pain, as well as average, least, and worst pain that had occurred over the preceding two weeks. The total score was used as the measure of pain severity (Jensen, Turner, Romano, & Fisher, 1999).

**Functional Limitations**—Functional limitations were assessed with a questionnaire addressing the degree of difficulty experienced in performing 16 common daily activities (International Association for the Study of Pain, 1995). Each activity was rated on a 5-point scale ranging from 1 (*no difficulty*) to 5 (*unable to do*), and the sum was used as the measure of functional limitations.

**Catastrophizing**—The Pain Catastrophizing Scale (PCS; Sullivan, Bishop, & Pivik, 1995) is a 13-item measure that assesses the extent to which patients endorse a negative cognitive style with regard to their pain experience. Item responses range from 0 (*not at all*) to 4 (*all the time*).

**Depression**—Depressive symptoms were assessed with an 8-item version of the Patient Health Questionnaire (PHQ; Kroenke, Spitzer, & Williams, 2001). Respondents indicate how frequently they have been bothered by each of several diagnostically relevant symptoms, using a 4-point scale ranging from 0 (*not at all*) to 3 (*nearly every day*). Although the PHQ is commonly used as a 9-item scale, for the present purpose we omitted the item addressing suicidal ideation. This 8-item version correlates almost perfectly with the full PHQ-9 (Kroenke, Spitzer, Williams, & Löwe, 2010).

**Interpersonal Relations**—Thwarted belongingness is a specific interpersonal construct (Joiner, 2005), but important aspects of it are assessed in the Outcome-Questionnaire-45 (OQ-45; Lambert et al., 1996). The 11-item Interpersonal Relations (IR) subscale of the OQ-45, in particular, measures satisfaction with relationships, as well as relationship problems. Each of the 11-items is rated on a 5-point frequency scale ranging from 0 (*never*) to 5 (*almost always*). The total IR score provided the index of interpersonal distress in belongingness.

**Self-Perceived Burden**—The Self-Perceived Burden Scale (SPBS; Cousineau, McDowell, Hotz, & Hébert, 2003) is intended for use with medical patients who may feel that their requirements for instrumental, emotional, or financial support place undue caregiving demands on significant others. Each of 10 areas of concern about burdening others is rated on a 5-point scale from 1 (*none of the time*) to 5 (*all of the time*). The SPBS total score was used to assess the construct of perceived burdensomeness.

**Suicidal Ideation**—One item each on the PHQ and the OQ-45 assess suicidal ideation. On the PHQ, the respondent is asked whether he or she has had “thoughts that you would be better off dead or hurting yourself in some way,” whereas on the OQ-45, the respondent is asked about “thoughts of ending my life.” Both are scored on frequency-of occurrence scales. The two items were correlated with one another at  $r = 0.79$ . The summed score was used as the criterion measure of suicidal ideation.

## Results

There were 124 individuals (40.9 %) who reported some degree of suicidal ideation (i.e., scores > 0). Although this distribution was skewed, the results were substantively similar when analysed as either raw or log-transformed values. Therefore, we have reported analyses based on raw scores.

The zero-order correlations of the different scales with the measure of suicidal ideation are shown in Table 1. The individual correlations were statistically significant for pain duration ( $p = .006$ ), catastrophizing ( $p < .001$ ), and depression ( $p < .001$ ), as well as for the IR scale ( $p < .001$ ) and the SPBS ( $p < .001$ ). The latter two measures were correlated with one another at  $r = 0.30$ ,  $p < .001$ .

A hierarchical multiple regression analysis was then conducted, with suicidal ideation as the criterion variable. The demographic characteristics of age and sex were entered first, the pain-related variables of pain intensity, duration, and functional limitations were added next, the cognitive and affective measures of catastrophizing and depression were added on a third step, and scores on the interpersonal variables from the IR scale and the SPBS were entered last.

The initial model did not achieve conventional levels of statistical significance, although the modest correlation of sex with suicidal ideation,  $r = -.11$ ,  $p = .054$ , resulted in a non-significant trend,  $F(2,297) = 2.86$ ,  $p = .059$ . Men tended to have more frequent suicidal

ideation than women. However, this model explained only about 2% of the variance,  $R^2 = 0.02$ .

With the entry of the pain-related measures on Step 2, the model was enhanced,  $F_{change}(3,294) = 4.53, p = .004$ , and centered largely in pain duration. Participants with longer histories of chronic pain reported more suicidal ideation. This model explained about 6% of the variance in suicidal ideation,  $R^2 = 0.06$ . However, this improved considerably with the addition of catastrophizing and depression on Step 3,  $F_{change}(2,292) = 38.84, p < .001$ . The model at this stage explained 26% of the variance,  $R^2 = 0.26$ , and there were significant independent contributions from sex, pain duration, catastrophizing, and depression.

Importantly, the final model, which added the interpersonal variables, showed a significant  $F_{change}(2,290) = 13.21, p < .001$ . The details of this model are shown in Table 1. The variables that contributed significantly included pain duration,  $t = 2.62, p = .009$ , depression,  $t = 4.82, p < .001$ , and scores on both the SPBS,  $t = 4.38, p < .001$ , and IR scale,  $t = 2.09, p = .037$ . This model explained about 32% of the variance in suicidal ideation,  $R^2 = 0.32$ . Catastrophizing, which was itself correlated with both SPBS,  $r = 0.43, p < .001$ , and IR scores,  $r = 0.38, p < .001$ , was no longer significant in the final model.

## Discussion

Chronic pain has been recognized as an important risk factor for suicide, but the identification of relevant predictors within the chronic pain population is at a preliminary stage of research. In a review of suicidality in chronic pain, Tang and Crane (2006) concluded that there is consistent evidence across studies that both depression and longer pain duration increase the likelihood of suicidal ideation, whereas the effects of gender and pain severity have been variable. They also concluded that the role of functional limitations and catastrophic thinking may be relevant, but require further study. It should be noted, however, that most research to date has examined correlates of suicidal ideation, rather than testing specific hypotheses derived from theory. The present study offers an advantage in this regard, as it tests a central tenet of the interpersonal theory of suicide; namely, that thwarted belongingness and perceived burdensomeness are unique and independent predictors of suicidal ideation.

The major finding in this context is that the interpersonal theory was well-supported by the data, in the sense that both self-perceived burden and distress in interpersonal relationships contributed significantly in the final regression model. Of the other variables, only pain duration and depression were retained as significant predictors. It is noteworthy that pain catastrophizing, which has been strongly associated with suicidal ideation in previous research (Edwards et al., 2006), was a significant predictor only until the interpersonal variables were added in the final step. Statistically, this may be due to shared variance between the PCS and the interpersonal measures. Conceptually it points to the importance and, perhaps, centrality of interpersonal aspects of suicidal thinking. We conclude therefore, that the interpersonal theory may have merit in explaining the elevated rates of suicidal ideation that is evident among individuals with chronic pain.

It should be noted that the participant sample included more women than men. A female preponderance of chronic musculoskeletal pain problems has often been found in both community surveys (Wijnhoven, de Vet, & Picavet, 2006) and clinic samples (Keogh, 2005; Mailis-Gagnon et al., 2007), so this finding is not unusual. Although not evident in the present study, women generally have higher rates of suicidal ideation than men (Canetto, 2008; Van Orden et al., 2010). They also have higher rates of non-lethal suicide attempts than men, but fewer completed suicides (Canetto, 2008; Van Orden et al., 2010). Thus, the study results may have greater relevance to those who are contemplating suicide rather than those who are actively engaging in life-threatening behavior. Fishbain, Bruns, Disorbio, and Lewis (2009) reported that people with chronic pain have elevated rates of some forms of suicidal ideation and behavior, but not necessarily all. Future research will require a more extensive focus on a wider spectrum of suicidal behavior than was addressed in the present research, using a more comprehensive approach to assessment.

An important limitation of this preliminary study is the use of secondary analysis of an existing dataset. Hence, the assessment of thwarted belongingness and perceived burdensomeness was not ideal. The IR scale of the OQ-45, for example, is a broad measure of relationship distress and contains items addressed to criticism and conflict, as well as to the isolation and alienation that are more clearly related to thwarted belongingness. The OQ-45 has good internal consistency, test-retest reliability, and concurrent validity (Lambert et al., 1996), and it is now used widely as an outcome measure in psychotherapy research and practice (Whipple & Lambert, 2011). To our knowledge, however, this study is the first to have used the IR scale to test the interpersonal theory of suicide. Therefore, there may be aspects of interpersonal role functioning that are assessed by the IR scale that are not central to a sense of belongingness. It will take further research, including different measures of the belongingness construct, to determine which dimensions are associated most closely with suicidal ideation.

Similarly, self-perceived burden pertains to the sense of guilt and responsibility that some medical patients feel for hardships experienced by loved ones and caregivers (McPherson, Wilson, & Murray, 2007). None of the items on the SPBS refer specifically to people in the respondent's life being happier or better off if the individual was dead or gone. Items of that type, however, comprise the core of the perceived burdensomeness scale of the Interpersonal Needs Questionnaire (Van Orden et al., 2012), which was developed in conjunction with the interpersonal theory. Arguably for research purposes, such items may overlap excessively with suicidal ideation and inflate the extent of the observed correlations. Indeed, in their study of perceived burdensomeness in chronic pain, Kanzler et al. (2012) used an item from a suicide intensity scale as a measure of burdensomeness. This issue of content overlap does not apply to the SPBS, so the fact that it figured so prominently in the prediction of suicidal ideation suggests that the theory is robust across alternative measures.

In summary, the interpersonal theory of suicide was supported in this study of patients with chronic pain. Methodological limitations notwithstanding, the key interpersonal constructs emerged as unique and independent predictors of suicidal ideation. Therefore, it seems that the interpersonal theory is highly relevant to chronic pain, and may have more general applicability to the problem of suicide in patients with chronic illness or disability.



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### Impact

- People with chronic pain have elevated rates of suicidal ideation, but few studies have tested specific predictions about suicide risk factors that are derived from theory. The interpersonal theory of suicide proposes that two factors – thwarted belongingness and perceived burdensomeness – combine to create the psychological context that leads to the desire to commit suicide. This exploratory study examined the applicability of the theory to chronic pain, and found that both of these interpersonal constructs contributed to the prediction of suicidal ideation in this population.
- These findings highlight the importance of interpersonal relations in the motivation for suicide in people with chronic pain, and perhaps for other populations with chronic illness or disability. They extend our understanding of suicidal ideation beyond the assessment of pain and depression and point to the importance of social interactions. Suicidal ideation may be most likely to arise among people with longstanding pain who are depressed, but especially if they feel alienated from valued social groups and believe that they have become a burden to others.
- These interpersonal dimensions merit greater attention in both research and clinical practice. When working with individuals who are expressing suicidal thoughts, it may be critical to explore the extent to which they perceive their disabilities as socially isolating, or as having a negative impact on significant others.

**Table 1**

Final Model of Multiple Regression Analysis of Independent Variables with Suicidal Ideation

Variable	Beta	<i>t</i> -value	Significance	Zero-order Correlation
Sex	-.09	-1.77	.078	-.11
Age	.03	0.57	.567	-.08
Pain severity	.01	0.11	.912	.08
Pain duration	.13	2.62	.009	.16
Functional limitations	-.09	-1.53	.127	.11
PHQ	.31	4.82	<.001	.45
PCS	.05	0.84	.404	.34
SPBS	.25	4.38	<.001	.41
IR	.12	2.09	.037	.35

*Note.* PHQ = Patient Health Questionnaire; PCS = Pain Catastrophizing Scale; SPBS = Self-Perceived Burden Scale; IR = Interpersonal Relations subscale of the Outcome Questionnaire-45. The final model is statistically significant,  $F(9,290) = 15.24$ ,  $p < .001$ ,  $R^2 = 0.32$ .