ORIGINAL ARTICLE

Suicidal Ideation and Perceived Burdensomeness in Patients with Chronic Pain

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■ **Abstract**

There is a clear relationship between suicide risk and chronic pain conditions. However, the exact nature of this link has been poorly understood, with risk attribution often limited to comorbid depression. Perceived burdensomeness has already been confirmed as a risk factor for suicidal ideation (SI) and suicide attempt in the general population. Self-perceived burden, studied among medically and terminally ill medical populations, has begun to receive a great deal of attention as a suicide risk factor. However, this risk has not been considered in an outpatient chronic pain population, a group likely to experience perceived burdensomeness as a particular problem. Guidelines recommend routine suicide risk screening in medical settings, but many questionnaires are time-consuming and do not allow for the assessment of the presence of newly identified risk constructs, such as perceived burdensomeness. This retrospective study examined the relationship between depression, perceived burdensomeness, and SI in a patient sample seeking behavioral treatment for chronic pain management. A logistic regression model was developed, with preliminary results indicating perceived burdensomeness was the sole predictor of SI, even in the presence of other well-established risk factors such as age, gender, depressive symptoms, and pain severity. Findings highlight the potential utility of a single-item screening question in routine clinical care as an incrementally superior predictor of SI in a chronic pain population. ■

Key Words: chronic pain, suicide risk, burdensomeness, depression, psychology, assessment

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INTRODUCTION

Chronic pain, a known risk factor for suicide, impacts 75 to 150 million individuals in the United States [1,2]. Suicidality, including suicidal ideation (SI), suicide attempts (SA), and suicide completion, has been repeatedly identified among patients with chronic pain [3–7]. The estimated prevalence of comorbid SI and chronic pain varies widely and ranges from 17% to

66% [8]. Unfortunately, the exact nature of the relationship between chronic pain and suicide risk is unclear and, surprisingly, poorly examined [6]. A recent focused MEDLINE search using the terms "chronic pain" and "suicide" revealed only 25 responses, reflecting inadequacy in the identification of factors that place patients with chronic pain at significant risk for suicidality. Obviously, a great deal more work is needed to amply examine how chronic pain and pain-related variables contribute to suicide risk.

Possible mechanisms affecting increased suicide risk for chronic pain sufferers include the role of mental health syndromes (eg, depression), the role of variables associated with chronic illness and suffering, and even the role of socioeconomic variables associated with pain-related disability. Studies have demonstrated a high comorbidity between chronic pain conditions and depression [9–12], the latter of which is a well-established independent risk factor for suicidality [13–15]. A review of chronic pain and depression found that 91% of 23 studies identified pain severity across a variety of medical conditions to be directly related to depression severity [6]. Despite this, other data indicate mental disorders like depression may have little impact on suicide risk, which is better accounted for by the sheer presence of a chronic physical condition [16]. The authors did note, however, that comorbid psychosocial variables contributing to mental disorder risk likely still contribute to suicide risk in subtle ways. Fishbain et al. [17] offer some insight into how the presence of a chronic physical condition like pain can result in increased suicide risk regardless of mental disorder comorbidity. In a study comparing suicide risk in a healthy community sample to that of a rehabilitation patient with chronic pain sample, the authors indicated that suicide risk among pain patients was almost twice that of the healthy sample. Patient with chronic pain were over 5 times more likely than acute pain sufferers to express a desire to die because of pain, and there was a clearly identified role of socioeconomic factors (eg, worker's compensation status, personal injury status, and litigation status) in increased chronic pain suicide risk.

As noted above, individual psychosocial variables that contribute to mental disorders and chronic pain may play a significant role in explaining suicide risk in chronic pain sufferers. Emerging evidence has consistently supported the role of "perceived burdensomeness" as an important factor in suicidality. Perceived burdensomeness is the belief that one is a burden to others, does not contribute to the group, and is a liability to the group's well-being or safety. Multiple findings indicate that perceived burdensomeness incrementally predicts SA and SI above and beyond other common suicide risk factors such as gender, depression, hopelessness, personality disorder diagnosis, and emotional reactivity [18–24]. Although studies point to a central role for perceived burdensomeness in SI and SA among the general population, no studies have yet examined the applicability of these results in a chronic pain population. Elevated levels of burdensomeness might be expected among patients with chronic pain owing to increased demands placed on support systems coupled with high levels of self-reported disability that potentially contribute to feelings of helplessness and ineffectiveness [25].

Patients with chronic medical conditions may be particularly attuned to the potential inconvenience their condition places on their caregivers [26]. There are differences in the definitions of self-perceived burden and perceived burdensomeness; yet, both constructs point to a similar sense that living (and dealing with subsequent disability) has a direct, negative impact on others' lives, which could understandably contribute to SI. Research examining cognitions of chronically or terminally ill patients often refers to "self-perceived burden" [27], defined as, "empathetic concern engendered from the impact on others of one's illness and care needs, resulting in guilt, distress, feelings of responsibility, and diminished sense of self" [28]. Although studies have not looked specifically at the relationship between SI and self-perceived burden, chronically or terminally ill medical patients who believe they are a burden to loved ones can experience a direct impact on end-of-life medical decision making, from choosing to forego or abate dialysis [29] to desiring death [28,30]. Interestingly, even hypothetical consideration of being a burden at the end of life can increase interest in physician-assisted suicide [31].

Chronic pain has been consistently associated with great functional impairment including social and occupational difficulties; a recent study of self-reported disability found many military chronic pain sufferers report at least moderate levels of disability [13]. Intuitively, moderate to high levels of perceived functional disability could lead to the development of the belief that living places too much burden on others. However, it is unknown whether any relationship exists between perceived burdensomeness and pain-related functional limitations/disability.

Patients with chronic pain are seen by a variety of different specialists who are tasked with both attending to their patient's medical needs and also addressing certain psychological needs. The DoD/VA Clinical Practice Guidelines (CPGs) for managing low back pain emphasizes the comorbidity between depression and pain, and recommend screening for psychological factors and emotional distress related to pain [32]. Guidelines for treating chronic pain with opioid therapy also recommend frequent suicide screening of patients with chronic pain and cite a "good" level of evidence for this practice [33].

Primary care settings may offer the single most important assessment opportunity in identifying pain-related suicide risk, as most individuals who commit suicide visit their physicians within 1 month of taking their lives and between 10% to 40% have an appointment with their PCPs the week prior to attempt [34]. Unfortunately, assessing psychiatric problems in medical settings (including administering mood-related questionnaires) can lead to significant costs in time, money, and personnel and may not necessarily help us understand how psychosocial symptoms contribute to a complex phenomenon like suicide risk in chronic pain.

Confusion exists regarding ideal screening methods in medical settings [34]. Typical screeners, such as the PHQ-9 [35] or the Beck Depression Inventory-II (BDI-II) [36] do not allow for assessing the presence of newly identified risk constructs, such as perceived burdensomeness. Research to date has studied perceived burdensomeness primarily through the use of the 18-item Interpersonal Needs Questionnaire (INQ) [23], which is an impractical tool to routinely utilize in medical settings owing to its length and the time required to administer.

Given the potential for a relationship between perceived burdensomeness and suicide risk in a chronic pain population, it follows that perhaps a single-item measure could help bridge the gap between research findings and clinical practice. Single-item measures have previously been used to assess psychosocial constructs in pain populations and have been shown to be as reliable and valid as longer measures [37]. Accordingly, the purpose of the present study was to conduct a preliminary investigation of the association between SI and perceived burdensomeness as measured with a single-item screener in a clinical sample of adult patients with chronic pain. A chronic pain sample was chosen as the subject of this effort owing to a high likelihood of perceived burdensomeness among individuals with chronic pain. It was hypothesized that, in the context of routine multidisciplinary care, endorsement of perceived burdensomeness would directly and positively relate to the risk of SI among patients with chronic pain.

METHODS

Participants and Procedures

Participants included 113 patients referred for pain-related health complaints to a Clinical Health Psychology (CHP) clinic in a large military medical center in the southwestern United States. Participants were predominantly married (73.5%) Caucasian (71.7%) females (65.2%), with an average age of 41.91 (SD = 13.4; range: 19 to 77) years. Age was approximately normally distributed, with no resulting concern regarding skew. Participants were referred to the CHP clinic by medical providers for consultative evaluation, treatment recommendations, and behavioral and psychosocial interventions for chronic pain conditions. Participants presented with the following pain-related concerns: headaches/migraines (27.4%), chronic lower back pain (15.9%), fibromyalgia syndrome (13.3%), temporomandibular disorder and other myofascial pain (8.8%), arthritis (2.7%), and complex regional pain syndrome (0.9%). Another 29.2% of patients experienced pain as a feature of a range of other primary health conditions and injuries (eg, various cancers, orthopedic injuries, and postsurgical complications).

Participants completed a standardized intake assessment that consists of several self-report measures assessing various areas of mental health and physical health functioning (described below). Following IRB approval, a retrospective chart review was conducted for all patients referred to the CHP clinic during a 2-year period for a routine consultative intake appointment. Patients seen only for group treatment (eg, cardiac rehab and insomnia management) or for a 1-time mental health or presurgical evaluations (eg, bariatric surgery, cochlear implants, and adjustment to HIV) were not included because these patients participated in specialized services and programs and did not complete standard clinic assessment instruments or participate in follow-up treatment or care. De-identified data were entered into a secured electronic database for subsequent data analysis. This study only examined

data for those patients with chronic pain as their primary presenting problem. Data points for 10 patients were identified as missing with no systematic pattern. These 10 patients were not statistically different from the remaining 103 patients in terms of all demographic and clinical variables included in this study. Participants with missing data were excluded from some analyses.

Materials

Depression. The Beck Depression Inventory-Second Edition (BDI-II) is a 21-item self-report instrument used to measure depression [36]. Each item consists of 3 statements reflecting increasing levels of severity for a particular symptom of depression. The BDI-II has been widely used and has accumulated a considerable research base. This measure possesses sound psychometric properties with high internal consistency, reliability and associated high levels of concurrent and construct validity with outpatient populations [36], and acceptable construct validity and internal consistency for assessment with chronic pain populations [38]. Scores range from 0 to 63, with higher scores indicating greater levels of depression. In the current study, an adjusted BDI-II score was calculated by subtracting the values of Item 9 (SI) from the total BDI-II score. This procedure was performed to reduce artificial inflation of depression scores caused by suicidality, which was used as a separate predictor. This procedure has been employed in previous research on chronic pain and suicidality [39,40].

Pain Severity. The Pain Severity subscale of the Multidimensional Pain Inventory (MPI) was used to measure pain severity [41]. This subscale consists of 3 items. The MPI is a widely used self-report instrument used in clinical and research settings for assessing overall adjustment of patients with chronic pain and outcomes of treatment interventions. The MPI was based on a normative sample of patients with chronic pain and has demonstrated very good psychometrics.

Perceived Burdensomeness. Perceived burdensomeness is described as the sense that the individual is a burden to others, does not contribute to the group, and is a liability to the group's well-being or safety [42]. Burdensomeness has been linked to a wide range of suicidal symptoms, including suicidal behaviors, SI, and multiple attempter status [19,21–24]. Several years ago, clinic personnel chose a single-item measure derived from Rudd's Suicide Intensity Scale [43] that assessed whether patients believed others' lives would be positively impacted by their death. While not directly addressing suicidality in terms of ideation, plan, or intent, the purpose of using this item was to capture perceived burdensomeness and was utilized as a part of routine intake paperwork. The item asked patients to rate the statement, ''It would be better for everyone involved if I were to die'' on a 5-point Likert scale measuring frequency of having the thought (1 = ''Never or none of the time'' to 5 = ''Always or a great many times''). Perceived burdensomeness as measured with a single-item index has been used previously [22] and provided 3 options for endorsement about the happiness of family members if the individual was gone. The item studied presently offers a greater range of response options and captures perceived burdensomeness beyond impact on relatives, which is particularly relevant given that patients with chronic pain may believe they are a burden to people other than their family members, such as more broadly defined caregivers [26–28]. Although it does not have published psychometrics, it is clear the item has face validity and conforms to the qualities of a valid and reliable single-item assessment as outlined by Patrician [37].

Suicidal Ideation. The BDI-II (see description above) includes 1 suicide item (Item 9) that consists of 4 ratings: 0 (''I don't have any thoughts of killing myself''), 1 (''I have thoughts of killing myself, but I would not carry them out''), 2 (''I would like to kill myself''), and 3 (''I would kill myself if I had the chance''). Item 9 has been found to be moderately correlated (r's = 0.56 to 0.58) with the Beck Scale for Suicide Ideation for both inpatient and outpatient clinical samples [42], and it has been previously used in studies with patients with chronic pain [44]. The predictive validity of this item has also been established using data from a prospective study of risk factors for suicide in clinical outpatients [45].

RESULTS

Means, standard deviations, and intercorrelations for all variables are presented in Table 1. Depression scores for the entire sample were slightly elevated and within the mild range (M = 18.05, SD = 10.99), as were pain severity scores (M = 57.14, SD = 18.62). Neither depression scores nor SI were associated with

Table 1. Means, Standard Deviations, and Intercorrelations for All Variables

	1	2	3	4	5	6	7	8
Age	–							
Gender	0.129	–						
Race	−0.062	0.009	–					
Marital status	0.201*	−0.061	0.067	–				
Adjusted BDI-II	0.096	0.043	−0.012	−0.169	–			
Burdensomeness	0.225*	−0.059	−0.095	−0.089	0.613**	–		
Pain severity	0.136	−0.012	−0.076	−0.140	0.113	0.105	–	
Suicide ideation	0.127	−0.121	−0.074	−0.171	0.577**	0.790**	0.144	–
Mean	41.91	0.65	0.72	0.73	18.05	1.34	57.14	0.15
SD	13.49	–	–	–	10.99	0.88	18.62	–

N = 109. BDI-II = Beck Depression Inventory-Second Edition. Gender is coded such that male = 0 and female = 1. Race is coded such that non-Caucasian = 0 and Caucasian = 1. Marital status is coded such that unmarried = 0 and married = 1. Adjusted BDI-II is the total BDI-II score minus the suicide ideation item (Item 9). For the categorical variables of gender, race, marital status, and suicide ideation, means reflect percentage of entire sample.
*P < 0.05, **P < 0.01.

Table 2. Stepwise Logistic Regression Predicting Suicide Ideation

	−2LL	Predictor	β	SE	P	OR	95% CI
Step 1	43.361	Age	0.036	0.029	0.224	1.036	0.978–1.098
		Gender	−1.707	0.876	0.051	0.181	0.033–1.009
		Race	−1.78	0.885	0.840	0.837	0.148–4.739
		Marital status	−1.386	0.908	0.127	0.250	0.042–1.483
		Depression	0.230	0.061	< 0.001	1.258	1.117–1.417
		Constant	−6.867	2.052	0.001	0.001	
Step 2	27.312	Age	0.004	0.042	0.931	1.004	0.935–1.089
		Gender	−0.903	1.121	0.421	0.405	0.045–3.649
		Race	−0.231	1.155	0.841	0.793	0.083–7.629
		Marital status	−2.903	1.638	0.076	0.055	0.002–1.359
		Depression	0.129	0.083	0.118	1.138	0.968–1.338
		Burdensomeness	3.068	1.063	0.004	21.503	2.680–172.547
		Constant	−7.056	2.858	0.014	0.001	
Step 3	27.206	Age	0.003	0.041	0.941	1.003	0.925–1.087
		Gender	−0.867	1.130	0.589	0.420	0.046–3.851
		Race	−0.335	1.213	0.076	0.782	0.066–7.704
		Marital status	−2.970	1.632	0.069	0.051	0.002–1.258
		Depression	0.129	0.082	0.118	1.137	0.968–1.337
		Burdensomeness	3.131	1.086	0.004	22.886	2.725–192.203
		Pain severity	−0.009	0.027	0.747	0.991	0.940–1.045
		Constant	−6.508	3.264	0.046	0.001	

gender, age, race, or marital status. Perceived burdensomeness was positively correlated with age, but was not related to gender, race, or marital status. As expected, depression, perceived burdensomeness, and SI were all significantly intercorrelated. Data were missing from 10 participants, so the overall sample size for the logistic regression was 103. Fifteen percent of the sample endorsed SI on the BDI-II Item 9 (n = 15), and 14 percent of the sample endorsed perceived burdensomeness (n = 14). Seventy-three percent of those who endorsed SI also endorsed perceived burdensomeness (n = 11).

A logistic regression model was next constructed with SI (dummy coded as endorsed = 1 or denied = 0) as the dependent variable (see Table 2). In step 1, a model containing age, gender, race, marital status, and depression significantly improved the ability to predict SI above and beyond the null model (χ^2 (5) = 41.181, −2LL = 43.361, P < 0.001, Nagelkerke R^2 = 0.592). Depression (β = 0.230, P < 0.001, OR = 1.258 [1.117 to 1.417]) and female gender (β = −1.707, P = 0.051, OR = 0.181 [0.033 to 1.009]) were significant predictors of SI. In step 2, perceived burdensomeness was added to model, which resulted in a statistically significant model (χ^2 (6) = 57.230, −2LL = 27.312, P < 0.001, Nagelkerke R^2 = 0.764) and incrementally improved model fit as compared to the first model (χ^2 (1) = 16.049, P < 0.001, Nagelkerke R^2 = 0.592). Perceived burdensomeness was the sole significant predictor of SI (β = 3.068, P = 0.004, OR = 21.503 [2.680 to 172.547]) in this step. Results remained significant even when covarying for pain severity.

DISCUSSION

This pilot study adds to our understanding of the relationships between chronic pain and SI. It is notable that a single-item screening question in routine clinical care emerged as an incrementally superior predictor of SI in a chronic pain sample. Our findings highlight the particular risk that patients with chronic pain may have when they view their existence as a burden to others. High rates of SI in chronic pain populations has led to the identification of various risk factors [46], but perceived burdensomeness may now be considered in our understanding of the elevated comorbidity between chronic pain and SI, beyond endorsed depressive symptoms, pain severity, age, or gender. Results are also consistent with the literature regarding chronically or terminally ill patients and the experience of being a ''self-perceived burden'' [27]. Interestingly, pain severity did not play a significant role in the relationship between perceived burdensomeness and suicidality.

There are a couple of potential reasons for this result. First, it is possible that suicide variance attributable to pain severity is already subsumed by perceived burdensomeness, which may conceptually overlap with the perception of pain severity. Individuals who perceive their pain as very intense may have a high likelihood of seeking help from others and perceiving themselves as a burden. Second, our sample was not powered to answer this particular question, so we might not have identified an effect of pain on the burdensomeness–suicide relationship if that effect was small. Future research should address this question directly to shed more light on this finding. This study was the first to examine a nonterminal, outpatient chronic pain population and their perception of being a burden; results highlight the significant impact of perceived burdensomeness in this vulnerable patient population.

Our findings should be considered preliminary, primarily because of the single-item assessment utilized in this study. Perceived burdensomeness as measured with a single-item index has been used previously and predicted SI and suicide attempter status above and beyond other well-established suicide risk factors including gender, personality disorders, depression, and hopelessness [22]. However, the single item used in our study differed from what was previously examined and has not yet been validated, although there is reason to believe that the chosen single-item measure was reliable and valid. The question we asked cannot assess the presence of perceived burdensomeness in the same thorough manner as the INQ.

Regardless, the potential utility of such a single-item measure as a rapid assessment tool for healthcare providers must be considered. Patients with chronic pain who are seen in a busy pain clinic or primary care office may not have a great deal of time to complete full-length measures (nor would the healthcare providers have a great deal of time to interpret them). A single question can serve as a valuable screening tool that could shape diagnostic decision making with minimal effort for the medical team and the patient. This is particularly valuable considering that some patients with upper extremity injuries may find written self-report measures laborious or even prohibitive owing to pain and injury. The face validity of the perceived burdensomeness question, and the fact it is not directly asking about suicide, nor hopelessness or mood, further support its use as a valuable tool for medical providers, in addition to other suicide screening protocols. Note that healthcare providers who opt to use this question—or any other method for suicide risk screening—should be prepared to respond appropriately, consistent with published guidelines and recommendations for questioning and assessing suicide risk in medical settings (eg, [33,47–49]). Although previously validated in research [44], it is also important to note that we also examined SI with a single-item measure that may limit the sensitivity of these measures to more subtle between-subjects differences in these constructs.

The unique nature of our sample is worth some consideration when interpreting our findings. We found a low rate of endorsed SI among the chronic pain sample, limiting the power of the study. Low rates of reported suicide risk are expected in a military sample owing to likely underreporting in this population, possibly related to stigma about mental health problems [50]. It must be noted, however, that the potentially low statistical power present in this study makes the significant findings even more remarkable because the uncovered relationships were strong enough to be exposed in light of low power. The clinic where data were collected was not the primary referral avenue for patients with chronic pain with serious mental health concerns, often serving as a tertiary or quaternary step in pain management referral pathways based on patient reports. Alternative treatment resources are typically utilized when acute/serious suicidality concerns are present (ie, mental health

clinic, partial or inpatient psychiatric hospitalization). Additionally, because all patients were either retired, active duty (AD) or dependents/family members of retired or AD military members, this chronic pain population has characteristics that may be unique to a military culture and may not fully represent the general U.S. population. The participants may also be unique because they likely presented with varying disability statuses not reported here, which could potentially impact degree of symptom endorsement (ie, some may be fighting against medical retirement or separation, some seeking medical retirement and/or additional VA benefits, and some are civilian spouses/children with or without disability concerns). However, symptom endorsement provided in the clinical study setting would likely have had minimal to no impact on actual military-related disability, as such evaluations are conducted elsewhere in the medical center. Generalizability of the findings may also be limited because patients with chronic pain in a behavioral health setting can be unique, perhaps experiencing different levels of psychopathology than patients with chronic pain in the general population.

It would be beneficial for replica studies to examine civilian populations and nonbehavioral health populations to determine the full extent of the relationship between chronic pain, perceived burdensomeness, and SI. A prospective research study would be an obvious next step, including larger sample sizes and full measures rather than single-item questions. Perceived burdensomeness assessed using the INQ [23] is clearly warranted. Additionally, studies examining other risk factors related to SI in chronic pain, such as fear avoidance [45], would further increase our understanding of the contribution of perceived burdensomeness to SI. It is also important for future studies to examine Joiner's Interpersonal-Psychological Theory of suicidal behavior [20] as a complete model in a chronic pain population, including examination of the constructs thwarted belongingness and increased capacity for self-harm, in addition to perceived burdensomeness.

Our preliminary findings highlight the potential importance of clinically assessing perceived burdensomeness in patients with chronic pain. More research is needed in this area, although early results emphasize how feasible it is to ask just 1 additional question that may rapidly identify possible high-risk patients in need of further assessment, intervention and/or referral to mental health providers. It is our hope that results of this study pave the way for greater understanding and increased quality of care for patients with chronic pain.

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