

REVIEW ARTICLE

Suicidality in chronic pain: a review of the prevalence, risk factors and psychological links

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ABSTRACT

Background. This paper reviews and integrates the growing literature concerning the prevalence of and risk factors for suicidality in chronic pain.

Method. A series of systematic searches in MEDLINE and PsychINFO identified 12 relevant articles examining suicide, suicide attempts, and suicidal ideation in chronic pain. A selection of theoretical and empirical work identifying psychological processes that have been implicated in both the pain and suicide literature and which may be related to increased suicidality was also reviewed.

Results. Relative to controls, risk of death by suicide appeared to be at least doubled in chronic pain patients. The lifetime prevalence of suicide attempts was between 5% and 14% in individuals with chronic pain, with the prevalence of suicidal ideation being ~20%. Eight risk factors for suicidality in chronic pain were identified, including the type, intensity and duration of pain and sleep-onset insomnia co-occurring with pain, which appeared to be pain-specific. Helplessness and hopelessness about pain, the desire for escape from pain, pain catastrophizing and avoidance, and problem-solving deficits were highlighted as psychological processes relevant to the understanding of suicidality in chronic pain.

Conclusions. Programmatic research is urgently required to investigate the role of both general and pain-specific risk factors for suicidality, to examine how the psychological processes mentioned above mediate or exacerbate suicidality, and to develop enhanced interventions for pain patients at risk.

INTRODUCTION

Although rates and methods vary, suicide is endemic throughout the world. In 2002, the World Health Organization (WHO, 2004) estimated the worldwide number of recorded suicide deaths to be approximately 873 000 per year, representing 1.8% of all deaths. Prevalence rates for non-fatal suicide attempts[†] and suicidal ideation are far higher. In the USA a recent

population survey indicated that 13.5% of respondents had experienced suicidal ideation in the past, 4.6% having made a suicide attempt (Kessler *et al.* 1999). These statistics are both an index of distress and an indication of a major management issue. They signify immense personal suffering and the economic costs associated with lost lives (Clayton & Barcelo,

individual deliberately initiates a non-habitual behavior that, without intervention from others, will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognized therapeutic dosage, and which is aimed at realizing changes which the subject desired, via the actual or expected physical consequences'. However, the studies reviewed differ in the definition of attempted suicide adopted, with many simply asking participants if they have ever made a 'suicide attempt'.

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[†] The World Health Organization (1986) defines attempted suicide or 'parasuicide' as: 'an act with non-fatal outcome in which an

1999) and increased health-care consumption (O'Sullivan *et al.* 1999). Despite continuing research into the risk factors for suicide and suicidal behaviours, it remains difficult to predict who is most vulnerable. This is partly because individuals attempting and completing suicide represent an extremely heterogeneous group encompassing (but not restricted to) those with psychiatric disorders such as depression or schizophrenia, those with substance misuse problems or personality disorders, and those experiencing chronic and debilitating physical illness. To maximize the potential to identify those vulnerable to suicide and prevent avoidable deaths, there is a need to understand not only the commonalities across suicidal individuals, but also the unique risk factors that contribute to the development of suicidal ideation and behaviour in high-risk subgroups.

Chronic pain – a high-risk subgroup

Chronic non-malignant pain is a common health problem, afflicting 1 in every 5 adults attending primary care in any year (Gureje *et al.* 1998). It is associated with poorer physical health (Eriksen *et al.* 2003; Mantyselka *et al.* 2003), lower quality of life (Hagg *et al.* 2003), and a higher risk of developing major depression (Ohayon & Schatzberg, 2003; Currie & Wang, 2004). Given the devastating impact chronic pain has on the lives of sufferers it has been glibly suggested when all medical treatment fails, chronic pain patients are left with limited choice, and committing suicide is one of seven conceivable solutions to the problem (Meilman, 1984).

Unfortunately, there is some truth in this suggestion. A review of the existing literature suggests that *suicidal ideation* is rather common among individuals suffering from chronic pain. As evident from Part 1 of Table 1, eight independent studies noted an elevated level of suicidal ideation in people with chronic pain. According to three of these studies that contrasted the prevalence of suicidality between people with and without chronic pain, suicidal ideation was on average three times as common in chronic pain sufferers relative to non-chronic pain sufferers (Breslau, 1992; Hinkley & Jaremko, 1994; Magni *et al.* 1998). While variations in samples and suicidality assessment method across

studies prevent a collective interpretation of the findings, individual studies indicate that the rate of current suicidal ideation was around 7% among chronic pain in-patients enrolled in a hospital multidisciplinary rehabilitation programme (Fisher *et al.* 2001) and between 5% and 24% among chronic pain out-patients (Hinkley & Jaremko, 1994; Treharne *et al.* 2000; Smith *et al.* 2004a,b). Lifetime prevalence of suicidal ideation was ~20%, with no apparent difference between a treatment-seeking (Breslau, 1992) and a community sample (Magni *et al.* 1998). However, among a group of patients who were also members of a chronic pain self-help organization, as many as 50% of these individuals had 'seriously considered suicide' (Hitchcock *et al.* 1994, p. 316).

Although existing data concerning suicide attempts in chronic pain are scant, pain has been found to contribute directly to 4% of all deliberate self-harm presentations to general hospitals in the UK, with 60% of these patients experiencing pain for 6 months or more (Theodoulou *et al.* 2005). Four studies reporting the prevalence of suicide attempts in chronic pain samples were identified. As is evident from Part 2 of Table 1, lifetime prevalence of attempted suicide ranged from 5% in people with musculoskeletal pain (Breslau, 1992; Smith *et al.* 2004b) to 14% in people with chronic abdominal pain (Magni *et al.* 1998). Relative to non-chronic pain sufferers, the rate of suicide attempts was on average twice as high in people suffering from chronic pain (Breslau, 1992; Hinkley & Jaremko, 1994; Magni *et al.* 1998).

Concerning the prevalence of completed suicide, an audit of patients at a pain centre in the USA calculated the rate to be 23/100 000 people per year (Fishbain *et al.* 1991). Although this figure is not as high as in psychiatric populations, it is nonetheless 2–3 times higher than that for the general population (Fishbain *et al.* 1991). This elevated suicide risk is supported by the findings from two prospective studies that have also converged to support the likely link between pain and suicide; the first, a 10-year longitudinal study of farmers, found that those with back pain were nine times more likely to commit suicide compared to those who were free of back pain, even when age, smoking, and social status were controlled for (Penttinen, 1995). The second, an 8-year prospective study,

Table 1. *A summary of the prevalence of suicidal ideation and suicide attempts in chronic non-malignant pain**

Author(s), year, and country	Sample size	Recruitment/Data collection method	Sample characteristics	Suicidality assessment method	Prevalence (people with chronic pain)	Prevalence (controls without chronic pain)
Part 1. Suicidal ideation						
Breslau (1992) (USA)	128	Recruited from a large health maintenance organization	Patients with migraine	One item from the NIMH Diagnostic Interview Schedule ^a	20.6 % (lifetime)	12.8 % (lifetime)
Hinkley <i>et al.</i> (1994) (USA)	241	Consecutive referrals to an out-patient pain assessment service	Orthopaedic patients (pain duration ≥7 months)	One interview item that asked about 'current suicidal intention or ideation'	5 % (current)	0.8 % (current)
Hitchcock <i>et al.</i> (1994) (USA)	204	Recruited via a national self-help organization	Individuals with chronic non-malignant pain	One questionnaire item that asked if one has 'seriously considered suicide'	50 % (lifetime)	N.R.
Magni <i>et al.</i> (1998) (USA)	289	Data were drawn from an epidemiological survey	American Hispanics with chronic abdominal pain	One item from the NIMH Diagnostic Interview Schedule ^a	21.6 % (lifetime)	10.6 % (lifetime)
Treharne <i>et al.</i> (2000) (UK)	123	Recruited from a hospital out-patient rheumatology clinic	Patients with rheumatoid arthritis	Items from the Nottingham Health Profile	11 % (N.S.)	N.R.
Fisher <i>et al.</i> (2001) (USA)	200	Recruited from a hospital multidisciplinary in-patient rehab programme	Chronic pain patients	Beck Depression Inventory Item 9 ^b	6.5 % (current)	N.R.
Smith <i>et al.</i> (2004a) (USA)	51	Recruited via newspaper and pain clinic advertisement	Non-cancer chronic pain patients	Beck Depression Inventory Item 9 ^b	24 % (current passive) 0 % (current active)	N.R.
Smith <i>et al.</i> (2004b) (USA)	153	Recruited from a tertiary out-patient pain centre	Non-malignant pain patients	A 42-item Structured Clinical Interview for Suicide History in Chronic Pain	19 % (current passive) 18.4 % (current active)	N.R.
Part 2. Suicide attempt						
Breslau (1992) (USA)	128	Recruited from a large health maintenance organization	Patients with migraine	One item from the NIMH Diagnostic Interview Schedule ^c	5.2 % (lifetime)	2.2 % (lifetime)
Hinkley <i>et al.</i> (1994) (USA)	241	Consecutive referrals to an out-patient pain assessment service	Orthopaedic patients (pain duration ≥7 months)	One interview item that asked about 'past suicide attempts'	9 % (lifetime)	5.6 % (lifetime)
Magni <i>et al.</i> (1998) (USA)	289	Data were drawn from an epidemiological survey	American Hispanics with chronic abdominal pain	One item from the NIMH Diagnostic Interview Schedule ^c	13.7 % (lifetime)	5.6 % (lifetime)
Smith <i>et al.</i> (2004b) (USA)	153	Recruited from a tertiary out-patient pain centre	Non-malignant pain patients	A 42-item Structured Clinical Interview for Suicide History in Chronic Pain	5.3 % (lifetime)	N.R.

* A more detailed table can be viewed online on the Journal's website (<http://journals.cambridge.org/action/displayJournal?jid=PSM>).

N.R., Not reported.

^a NIMH, National Institute of Mental Health: 'Have you ever felt so low you thought of committing suicide?' (suicidal ideation).

^b Beck Depression Inventory item 9 is anchored: 0, 'I do not have any thoughts of killing myself'; 1, 'I have thoughts of killing myself but I would not carry them out' (passive suicidal ideation); 2, 'I would like to kill myself' (active suicidal ideation); 3, 'I would kill myself if I had the chance' (active suicidal ideation).

^c 'Have you ever attempted suicide?' (suicide attempt).

found that patients reporting regional and widespread body pain had almost twice the risk of death by accident, violence and suicide (Macfarlane *et al.* 2001).

Risks factors for suicide in chronic pain patients

In contrast to the wealth of data available concerning risk factors predicting future suicide in general, relatively little is known about potential risk factors specific to patients with chronic pain (Fishbain, 1999). To systematically identify work previously published on this topic, a series of searches were performed in two electronic databases (MEDLINE and PsycINFO) using each of the keywords suicid*†, parasuicide*, overdose*, self-harm*, self-injur* together with 'chronic pain', 'persistent pain', 'physical pain', 'back pain', 'headache', 'musculoskeletal pain', 'fibromyalgia' and 'arthritis'. The searches were limited to articles that reported original data concerning suicide risk factors in chronic pain populations published between 1966 and 2004. However, conference abstracts, theses, review chapters, case studies, and articles published in languages other than English were not included. All returns from the searches were then assessed, independently, by the authors for their suitability based on their titles and abstracts. A total of 12 relevant articles were identified, reviewed, and compared to findings in the general suicide literature (wherever possible). The following section introduces eight risk factors for suicidality in chronic pain as highlighted in these studies (see Table 2 for a summary of the evidence in support of each of the eight risk factors, together with methodological details).

General risk factors

Family history of suicide

In line with the wider suicide literature showing a strong link between family history and current suicidality (Cheng *et al.* 2000; Phillips *et al.* 2002; Runeson & Asberg, 2003), results of one study (Smith *et al.* 2004*b*) showed that the risk of experiencing current suicidal ideation was 7–8 times as high in chronic pain patients with a positive family history of suicide as in chronic pain patients without such history, even when other

significant covariates (e.g. depression) were adjusted for. However, as family history of suicide is not assessed in other studies, there are no available data to suggest that it is also a risk factor for attempted and completed suicide in chronic pain.

Previous suicide attempt

One of the studies reviewed provided evidence confirming the role of a previous suicide attempt in the development of subsequent suicidality in chronic pain, over and above the effect of depression (Fisher *et al.* 2001). Compared to depressed but non-suicidal chronic pain patients, it was found that depressed chronic pain patients who were experiencing suicidal thoughts were twice as likely to have made at least one suicide attempt before (Fisher *et al.* 2001). While it has been noted in the general suicide literature that a history of suicide attempt is also a major risk factor for future suicide attempts (Beautrais, 2001) and completed suicide (e.g. Beautrais, 2001; Phillips *et al.* 2002), it is unclear to what extent this is also the case in chronic pain.

Being female

Two of the studies reviewed suggested that, relative to male chronic pain sufferers, female sufferers were more vulnerable to suicidal ideation (Treharne *et al.* 2000) and death by suicide (Timonen *et al.* 2003). These are interesting findings given the fact that in the western world deaths by suicide are far more common in men (Williams, 2001). However, care must be taken when interpreting these data as in two other studies with relatively smaller samples of pain clinic patients (Smith *et al.* 2004*a,b*), the association between gender and suicidality did not reach statistical significance. Moreover, it is possible that the higher vulnerability to suicidality in female pain sufferers is inflated by an overrepresentation of females in the sampled population (rheumatoid arthritis) (Riise *et al.* 2000).

Presence of co-morbid depression

Four of the studies reviewed provided consistent evidence in support of the role of depression in augmenting the risk of suicidal ideation and suicide attempt among patients with chronic pain (Breslau, 1992; Magni *et al.* 1998; Treharne *et al.* 2000; Fisher *et al.* 2001; Timonen *et al.* 2003). While this is not a surprising finding given the

† An asterisk (*) indicates truncation of keywords.

Table 2. *A summary of the evidence for the risk factors predicting suicidality in chronic non-malignant pain**

	Risk factor	For the prediction of ...	Source of evidence	Sample size and characteristics	Suicidality assessment method	Brief summary of results
1	Family history of suicide	Suicidal ideation	Smith <i>et al.</i> (2004b) (USA)	<i>n</i> = 153 chronic pain out-patients	Structured Clinical Interview for Suicide History	Positive family history of suicide attempts/completions associated with greater likelihood of current suicidal ideation (AOR = 7–8)
2	Previous suicide attempt	Suicidal ideation	Fisher <i>et al.</i> (2001) (USA)	<i>n</i> = 39 chronic pain in-patients	Beck Depression Inventory Item 9 ^a	Previous suicide attempt more likely in depressed/suicidal patients (54%) compared to depressed/non-suicidal (23%)
3	Being female	Suicidal ideation	Treharne <i>et al.</i> (2000) (UK)	<i>n</i> = 123 hospital RA out-patients	Items from the Nottingham Health Profile	More female RA patients (14%) reported suicidal ideation than male RA patients (3%)
	Being female	Completed suicide	Timonen (2003) (Finland)	<i>n</i> = 1585 suicide victims	Official death certificate	Females over-represented among RA patients who committed suicide (53% RA women v. 17% women with neither RA nor OA)
4	Co-morbid depression	Suicidal ideation	Breslau (1992) (USA)	<i>n</i> = 1007 young adults	Item from NIMH Diagnostic Interview Schedule ^b	MDD in migraine with aura increased odds for suicidal ideation (AOR = 19.6) compared to migraine with aura alone (AOR = 2.4) and MDD alone (AOR = 7.4). Similar results for migraine without aura
	Co-morbid depression	Suicidal ideation	Treharne <i>et al.</i> (2000) (UK)	<i>n</i> = 123 hospital RA outpatients	Items from Nottingham Health Profile	Suicidal ideation more common in depressed RA patients (30%) than those who were not (7%)
	Co-morbid depression	Suicide attempt	Breslau (1992) (USA)	<i>n</i> = 1007 young adults	Item from NIMH Diagnostic Interview Schedule ^c	MDD in migraine with aura increased odds for suicide attempt (AOR = 23.2) compared to migraine with aura alone (AOR = 4.3) and MDD alone (AOR = 7.8). Similar results for migraine without aura
	Co-morbid depression	Completed suicide	Timonen <i>et al.</i> (2003) (Finland)	<i>n</i> = 1585 suicide victims	Official death certificate	Co-morbid depressive disorders preceded suicides in 80% female RA patients, compared to 31% in those with OA and those with neither RA nor OA
5	Location and type of pain	Suicidal ideation	Breslau (1992) (USA)	<i>n</i> = 1007 young adults	Item from NIMH Diagnostic Interview Schedule ^b	Migraine with aura alone associated with increased odds (AOR = 2.4) for suicidal ideation, compared to migraine without aura (AOR = 1.7)
	Location and type of pain	Suicidal ideation	Smith <i>et al.</i> (2004b) (USA)	<i>n</i> = 153 chronic pain out-patients	A 42-item Structured Clinical Interview for Suicide History	Abdominal pain linked to a 4- to 6-fold greater risk of suicidal ideation, neuropathic pain associated with a lessened risk
	Location and type of pain	Suicide attempt	Breslau (1992) (USA)	<i>n</i> = 1007 young adults	Item from NIMH Diagnostic Interview Schedule ^c	Migraine with aura alone associated with increased risk (AOR = 4.3) for suicide attempt, compared to migraine without aura (AOR = 2.7)
	Location and type of pain	Suicide attempt	Magni <i>et al.</i> (1998) (USA)	<i>n</i> = 289 people with chronic abdominal pain	Item from NIMH Diagnostic Interview Schedule ^c	Suicide attempt rate 2–3 times higher in those with chronic abdominal pain compared to those without
	Location and type of pain	Completed suicide	Penttinen (1995) (Finland)	<i>n</i> = 4199 male farmers	Official death certificate	Nine times greater risk of suicide in farmers with back pain at 10-yr follow-up than those without back pain, controlling for age, smoking and social status
	Location and type of pain	Completed suicide	Macfarlane <i>et al.</i> (2001) (UK)	<i>n</i> = 6569 individuals	Office for National Statistics data	Regional and widespread pain associated with 3 and 5 times risk of death by accidents, suicide, or violence at 8-yr follow-up
6	High pain intensity	Suicidal ideation	Smith <i>et al.</i> (2004a) (USA)	<i>n</i> = 51 chronic pain out-patients	Beck Depression Inventory Item 9 ^a	High pain intensity was one of two discriminators of the presence/absence of PSI (<i>p</i> < 0.001)
7	Long pain duration	Suicidal ideation	Hinkley <i>et al.</i> (1994) (USA)	<i>n</i> = 635 chronic pain out-patients	Interview item that asked about 'current suicidal intention or ideation'	Greater proportion of long-duration pain patients experienced current suicidal ideation, compared to patients with shorter pain duration (<i>p</i> < 0.05)
	Long pain duration	Suicidal ideation	Treharne <i>et al.</i> (2000) (UK)	<i>n</i> = 123 hospital RA out-patients	Items from the Nottingham Health Profile	Suicidal ideation was more likely if RA > 4 yr (12%) compared with RA < 2 yr (7%)
8	Co-morbid insomnia	Suicidal ideation	Smith <i>et al.</i> (2004a) (USA)	<i>n</i> = 51 chronic pain out-patients	Beck Depression Inventory Item 9 ^a	Sleep-onset insomnia was one of two discriminators of the presence/absence of PSI (<i>p</i> < 0.001)

* A more detailed table can be viewed online on the Journal's website (<http://journals.cambridge.org/action/displayJournal?jid=PSM>).

AOR, Adjusted odds ratio; RA, rheumatoid arthritis; OA, osteoarthritis; MDD, major depressive disorder; PSI, passive suicidal ideation.

^a Beck Depression Inventory item 9 is anchored: 0, 'I do not have any thoughts of killing myself'; 1, 'I have thoughts of killing myself but I would not carry them out' (passive suicidal ideation); 2, 'I would like to kill myself' (active suicidal ideation); 3, 'I would kill myself if I had the chance' (active suicidal ideation).

^b NIMH, National Institute of Mental Health: 'Have you ever felt so low you thought of committing suicide?' (suicidal ideation).

^c 'Have you ever attempted suicide?' (suicide attempt).

high co-morbidity between pain and depression (Dworkin & Gitlin, 1991; Fisher *et al.* 1997) and between depression and suicide (Harris & Barraclough, 1997; Kessler *et al.* 1999; Yen *et al.* 2003), it is worth noting that depression does not always predict suicidality in chronic pain (Smith *et al.* 2004b) and that there is a subset of chronic pain patients who are depressed but not suicidal (Fisher *et al.* 2001).

Pain-specific risk factors

Location and type of pain

There is some evidence suggesting that the location and type of pain may have implications for the risk of suicidality. In relation to the location of pain, the presence of back pain (Penttinen, 1995) and widespread body pain (Macfarlane *et al.* 2001) were associated with a higher risk of future death by suicide, compared to pain-free individuals. In relation to the type of pain, pains of different qualities and characteristics appeared to have differential power in predicting suicidality. For instance suicidal ideation and suicide attempts were found to be twice as common in migraine with aura as in migraine without aura, regardless of the presence of co-morbid depression (Breslau, 1992). Suicidal ideation was more prominent among people reporting chronic abdominal pain, whereas people diagnosed with neuropathic pain were less likely to experience suicidal ideation (Magni *et al.* 1998; Smith *et al.* 2004b). Finally a study by Amir *et al.* (2000) found an overall elevation on a measure of suicidal risk in a mixed group of patients with chronic pain, when compared to controls, but identified no difference between patients with fibromyalgia and controls when these individuals were examined separately. Together, these findings highlight the importance of studying the effect of various subtypes of pain on suicidality individually. In particular, it will be of theoretical and clinical interest to investigate in future research why certain types of pain (e.g. back pain, abdominal pain) promote the risk of suicide whereas others (e.g. neuropathic pain) do not.

High pain intensity

Although it seems logical to assume that the amount of pain an individual suffers from is proportional to the degree of suicidal ideation or

behaviour exhibited, evidence drawn from studies testing this assumption is not so clear-cut. Of the two studies reviewed that examined pain intensity and suicidality, one noted a significant positive relationship (Smith *et al.* 2004a) whereas the other found pain severity to be independent of suicidal ideation (Smith *et al.* 2004b). Clearly, more research is required to clarify the role of pain intensity in manifesting suicide risk.

Long pain duration

There is some initial evidence indicating that the longer the pain duration, the more likely it is for a patient to experience suicidal ideation. In the first study by Hinkley & Jaremko, (1994), it was noted that patients who had a longer pain duration (>3 months) differed from those who had a shorter pain duration (<3 months) on a range of psychological variables, including having a greater likelihood of experiencing suicidal ideation. In the second study by Treharne *et al.* (2000), it was found that the risk of experiencing suicidal ideation was greater in patients with longstanding rheumatoid arthritis compared to those with early rheumatoid arthritis.

Presence of co-morbid insomnia

One of the studies reviewed (Smith *et al.* 2004a) highlighted sleep-onset insomnia as one of two significant discriminators of the presence and absence of suicidal ideations in chronic pain patients. Specifically, it was found that patients who reported severe and frequent sleep-onset insomnia with concomitant daytime dysfunction and high pain intensity were more likely than those with none of these problems to report suicidal ideation, even when the effect of depression was controlled for. Sleep-onset insomnia severity alone explained 67% of the variance accounted for. These findings are consistent with previous research showing a higher prevalence of sleep disturbance in suicidal than non-suicidal individuals (Singareddy & Balon, 2001) and underscore the importance of studying the interaction between pain-specific and non-pain-specific risk factors when investigating suicidality among chronic pain patients.

Limitations

The studies considered here have taken the first important step towards delineating risk factors

associated with suicidality in chronic pain. However, it is obvious that the amount of evidence accrued for each risk factor is rather limited. In terms of predicting suicidality, most studies focused on suicidal ideation rather than suicide attempts or completed suicide. While suicidality can be conceptualized as a process that starts with fleeting suicidal thoughts and then evolves through more concrete plans to suicide attempt and finally completed suicide, it is important to note that risk factors that predict suicidal ideation may not necessarily predict a subsequent suicide attempt or completed suicide. Further, the studies that have been conducted to date suffer from a number of methodological limitations, which restrict the conclusions that can be drawn. The most important of these are outlined as follows.

First, the majority of the studies reported used questionnaire measures of suicidality, with several relying on single items to determine rates of suicidal ideation or behaviour (e.g. Treharne *et al.* 2000; Fisher *et al.* 2001; Smith *et al.* 2004a), and others simply asking individuals whether they had ever made a 'suicide attempt' (Hinkley & Jaremko, 1994; Hitchcock *et al.* 1994). While such questions have face validity, their reliability in reflecting a person's current suicidal intentions and past suicidal ideation and behaviour is unknown. Although a similar pattern of elevated suicidal risk in chronic pain individuals has been observed in other studies using validated multi-item scales to measure suicidality (e.g. Amir *et al.* 2000; Smith *et al.* 2004b), in order to draw parallels between research on suicidality in chronic pain and research in the broader suicide literature it would be beneficial for future studies to adopt more rigorous methods of assessment, for example incorporating the widely used Beck scales to assess suicidality (Beck *et al.* 1979).

A second important limitation concerns the fact that, apart from a handful of prospective population-based studies (e.g. Penttinen, 1995; Macfarlane *et al.* 2001; Timonen *et al.* 2003), most of the research reviewed has examined suicidality in chronic pain retrospectively. This introduces the risk of self-reporting errors, recall bias, and memory failure. Additionally because the timing of first onset of suicidality relative to the onset of pain has rarely been assessed, a causal relationship between chronic pain and

suicidality cannot be inferred (e.g. Breslau, 1992; Magni *et al.* 1998; Smith *et al.* 2004a). It is likely that at least part of the association between suicidality and chronic pain results from the inclusion of individuals experiencing chronic pain in the context of pre-existing and longstanding psychiatric or substance misuse problems. Future research should consider conducting a formal psychiatric assessment excluding patients with co-morbid psychopathology.

Third, studies to date have not adequately addressed the issue of the extent to which increased risk of suicidality is a function of pain, *per se*, as opposed to the disability that pain produces. Although pain has unique characteristics that make it particularly likely to provoke suicidal ideation (e.g. its ability to capture attention, interrupt ongoing activities and be physically unbearable, see 'The desire for escape from pain' section below) it also has commonalities with other disabling conditions (e.g. physical limitations, stigma). Studies comparing rates of suicidality in individuals matched for levels of functional impairment, but suffering from chronic painful *versus* non-painful conditions would go some way towards determining the extent to which increased suicidality in chronic pain populations is pain-specific.

Finally, several studies have not controlled for the range of social and demographic factors that are likely to distinguish chronic pain patients from the general population (e.g. older age, financial hardship, unemployment). Since these variables may independently confer increased suicide risk (Williams, 2001), their omission is problematic and should be borne in mind when interpreting the existing findings. Similarly, while several studies have identified risk factors for suicidality in chronic pain after controlling for level of depression (e.g. Breslau, 1992; Fisher *et al.* 2001; Smith *et al.* 2004a) most have not done so. More systematic research is required to isolate the effect of pain on suicidality from these variables, as well as to understand the mechanisms by which pain interacts with these factors to increase suicide risk.

Although the existing literature suffers from some limitations, the findings of studies to date do indicate that the suicidality in chronic pain is an important issue in need of further investigation. In the following section we discuss how

different aspects of pain experience may increase risk of suicidality, drawing on existing understanding of the psychological processes involved. The aim is not to provide an exhaustive review of psychological theories of suicidality or the psychological consequences of chronic pain, but to highlight points of overlap and areas that may be worthy of future research and to shed light on the mechanisms through which physical pain might evolve into psychological pain, informing clinical interventions for patients distressed by chronic pain.

Helplessness and hopelessness about pain

Helplessness, the conviction that nothing can be done to change an undesirable situation and hopelessness, the expectation that desirable outcomes will never occur (Seligman, 1975; Abramson *et al.* 1989), are common experiences in patients struggling with chronic pain. Indeed, previous articles have quoted patients expression of their frustration verbatim, '[the] pain is now beyond coping with and if [doctors] say they can't do anything I don't know what I'm going to do, sometimes I just want to quit taking everything 'cause it doesn't seem like anything's working' (Seers & Friedli, 1996; Thomas, 2000). In the general suicide literature, findings drawn from a number of cross-sectional and longitudinal studies have attested to the role of hopelessness in the development of suicidal ideation and behaviour (e.g. Minkoff *et al.* 1973; Beck *et al.* 1975, 1985; Dyer & Kreitman, 1984) and this is mirrored in the finding that pain patients themselves attribute their suicidal thoughts to hopeless feelings associated with pain (Hitchcock *et al.* 1994). It seems plausible to hypothesize that the relationship between chronic pain and suicidality may be at least partially mediated by helplessness/hopelessness about the ability to cope and about the chances of future relief from pain. Previous studies have linked helplessness to the development of functional disability (Nicassio *et al.* 1993), co-morbid depression (Hommel *et al.* 1998) and anxiety (Lindroth *et al.* 1994), as well as higher rates of early mortality (Callahan *et al.* 1996) in rheumatoid arthritis patients. However, research has yet to systematically examine whether helplessness/hopelessness about pain is in fact linked to increased suicidality after controlling for co-morbid depression, and the extent to which

helplessness/hopelessness mediates associations between pain-related variables and suicidal ideation and behaviour. Since helplessness/hopelessness has repeatedly been linked to suicidality in the broader literature and may be amenable to psychological interventions future research in this area is called for.

The desire for escape from pain

The desire for escape from an unbearable situation is one of the most commonly reported motivations for suicidal behaviour (Hjelmeland *et al.* 2002). Indeed it has repeatedly been suggested that both suicide and suicidal behaviour can be viewed in terms of an attempt to escape from aversive self-consciousness (Baumeister, 1990), unbearable 'psychache' (Shneidman, 1997) or intolerable situations in which the opportunity to escape or to receive relief are perceived to be remote (e.g. Williams & Pollock, 2000; Williams, 2001). These conceptualizations may be pertinent to the understanding of suicidality in chronic pain since, by virtue of its intrusive and attention-demanding characteristics (Eccleston & Crombez, 1999), pain is particularly difficult to 'escape'. Pain's capacity to disrupt thoughts, activities and even sleep renders most forms of temporary respites ineffectual (Thomas, 2000). For some patients, pain may become so acute that it is unbearable and they perceive their future to be 'an eternity of suffering', 'pill after pill after pill' as Thomas (2000) reported. It is unclear which factors fuel the desire to escape and result in suicide being regarded as a viable means of terminating suffering, but it has been suggested that the feelings of defeat and entrapment play a key role (Williams *et al.* 2005). The authors are currently investigating the role of mental defeat in chronic pain and the role of entrapment in suicidal behaviour. Moreover, the link between pain-related insomnia and suicidality may also help explain suicidality within this framework as difficulty in sleeping removes one of the only respites from pain, potentially increasing desperation and exacerbating suicidal ideation further.

Pain catastrophizing and avoidance

Pain catastrophizing (a form of extremely negative thinking represented by a person taking the view that pain or a situation related

to pain will lead to or is associated with a physical or mental catastrophe) and pain avoidance (the tendency to avoid engaging with or to try to escape from potentially pain-provoking activities or situations) are two psychological responses to pain that have received considerable research attention and which may be associated with increased risk of suicidality. It is certainly possible, in some patients, to identify a progression from catastrophic interpretation of pain and its consequences, to negative emotions, and then to the desire to escape through suicide. For example in Seers & Friedli (1996), a patient overwhelmed by the pain revealed his/her suicidality as follows: '[pain] has stopped me leading my whole life. I'm petrified [doctors]'ll say I have to learn to live with this level of pain. Pain is 90/100. I feel I would rather die. I'd like to be unconscious. Deep inside I feel suicidal. Do I really want to see tomorrow? Can't see through the pain when there is so much and I know I do not want to live with it.' While the direct association between pain catastrophizing and suicidal ideation awaits empirical confirmation, it is understood that catastrophizing about pain amplifies pain experience, increases consumption of analgesics medication, worsens social and occupational functioning, and intensifies negative emotions (see Sullivan *et al.* 2001 for a review). Given the link between increased pain intensity and suicidality (Smith *et al.* 2004a) and between depression and suicidality (Breslau, 1992), pain catastrophizing forms a logical target for intervention.

Problem-solving deficits

Adapting to a life with chronic pain is no easy task and individuals requires a huge amount of effort to deal with problems secondary to the pain, such as potential financial loss ['I'm worried I'll lose my job as off sick. Try to keep working even when feel really ill' (Seers & Friedli, 1996, p. 1165)] and added strain on social and family lives ['Pain separates you. It's really hard to be involved with people when you're in pain' (Thomas, 2000, p. 692), 'Husband too drained to be sympathetic. Children affected by it – don't do things physically with them. They treat me as fragile. I have cheated him of a normal life' (Seers & Friedli, 1996)]. Frequently, patients need to make marked adjustments to life

goals and priorities in order to live with the pain. In the general suicide literature it has been suggested for some time that deficits in problem-solving abilities represent an important psychological risk factor in suicidal behaviour (see Pollock & Williams, 1998 for a review) and more recent research suggests that suicidal individuals also have greater difficulties in making specific plans of how to achieve desired goals in the future (Vincent *et al.* 2004). To date research has not examined whether suicidality in pain is linked to difficulties in solving pain-related problems or planning for the future, although poor perceived problem-solving skill has been linked to higher ratings of pain unpleasantness, disability, level of depression and hopelessness in patients with low back pain (Witty *et al.* 2001). However given the central role of problem-solving deficits in the psychological profile of suicidal patients more generally, the great demand that pain is likely to place on these skills and the potential use of problem-solving therapies as an intervention, this is likely to be an important area for future research.

Implications

The findings of the literature reviewed above have at least three implications for the understanding and management of suicidality in the chronic pain population.

Clinical audit

It has become clear that direct and precise information about suicide in chronic pain is often unavailable. This to some extent reflects a lack of concern and to some extent the absence of an infrastructure to facilitate the systematic collection of relevant data. Regular audit, both locally at individual pain centres, and aggregated across pain clinics, would provide precious data not only concerning the current status of the problem, but also aiding the identification of new short- and long-term predictors of suicide not investigated by previous research (Hawton & Morgan, 1994). In addition, it is likely that the introduction of regular clinical audit would accelerate the development of routine management of suicidal risk in pain clinics, optimizing staffs capacity to effectively detect and handle acute suicidal risk in pain patients presenting for treatment.

Limiting means of suicide

Taking drug overdose remains as the commonest (75%) method of suicide among chronic pain patients who have survived a previous suicide attempt (Smith *et al.* 2004*b*). Since these patients are often prescribed analgesics and tricyclic antidepressants for pain relief (McQuay & Moore, 1997), they may have ready access to drugs which are dangerous in overdose. Considering that the rates of suicidal behaviour are, to a certain extent, influenced by the availability of lethal means (e.g. Hawton *et al.* 2001, 2004), it seems sensible for clinicians to have a careful assessment of their pain patients' mental state (including the presence of any suicidal thinking) in order to inform prescribing decisions (e.g. Theodoulou *et al.* 2005).

Developing psychological interventions for suicidality in chronic pain

The current review has drawn attention to the role played by several pain-specific risk factors and a number of psychological processes that may be involved in the escalation of suicidality in patients with chronic pain. Several of these variables, namely sleep-onset insomnia, hopelessness, catastrophizing and avoidance, goal adjustments and problem-solving, are amenable to psychological intervention. In fact, there are existing treatments with proven efficacy that target these factors both in chronic pain and in other clinical groups (e.g. Salkovskis *et al.* 1990; Linehan *et al.* 1993; Hayes *et al.* 1999; Segal *et al.* 2002; McCracken *et al.* 2005). Programmatic research is now called for to investigate the extent to which interventions targeting these psychological factors are able to improve our capacity to reduce suicide risk among the most distressed chronic pain patients.

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DECLARATION OF INTEREST

None.

NOTE

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