

**Prevalence and correlates of suicidal thoughts and suicide attempts in people prescribed pharmaceutical opioids for chronic pain.**

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## **Abstract**

**Objectives** – The main objectives of the paper were (1) to examine the prevalence of suicidality in a large community-based chronic pain sample taking prescribed opioids for chronic pain; and (2) to examine general and pain-specific factors that predict such ideation, and the transition from ideation to making a suicide attempt (ideation-to-action).

**Methods** - Baseline data from the Pain and Opioids IN Treatment (POINT) study with a cohort of 1,514 community-based people prescribed opioids for chronic non-cancer pain across Australia.

**Results** – Past 12 month suicidal ideation was reported by 36.5% of the cohort and 16.4% had made a lifetime suicide attempt (2.5% in the last 12 months), after the onset of their pain condition. Suicidal ideation in the past 12 months was independently associated with a past suicide attempt (AOR 4.82, 95%CI 2.43-9.56) and past 12 month depression (AOR 4.07, 95%CI 1.88-8.78). Only a lower pain-self efficacy score was independently associated with past 12 month ideation-to-action (AOR 0.98, 95%CI 0.88-0.99). Notably, only general suicide risk factors were associated with 12 month suicidal ideation; but for past-year ideation-to-action, pain specific factors also had independent associations.

**Discussion** – The study is one of the first to comprehensively examine general and pain-specific risk factors for suicidality in a large chronic pain sample in which suicidal ideation was common. A low pain self-efficacy score was the only factor independently associated past 12 month ideation-to-action.

## Introduction

Chronic non-cancer pain (CNCP) has been estimated to affect between 17% [1] and 41% [2] of the general population. It is associated with poorer physical health [3], lower quality of life [4, 5] and a greater risk of developing depression [6] and other mental health problems [7, 8]. Although there are interventions for CNCP, it is often the case that many patients have to accept a lifetime treatment plan for the management of their pain, and that their pain is not completely alleviated. In one European study, approximately 40% of people with pain perceived that management of their pain was inadequate [9]. It is not surprising then, that rates of suicidal ideation, attempted and completed suicides are high amongst this group of patients [10]. People suffering from chronic non-cancer pain (CNCP) have almost double the risk of death by suicide [11] and are two-to-three times more likely to experience suicidal ideation or make attempts [11]. Furthermore, approximately two-thirds of those that had attempted suicide had a history of chronic pain [12]. As the population in developed countries ages, the incidence and prevalence of chronic pain will increase so research on the relationship between chronic pain and suicidality is timely.

Previous research suggests that there are both pain-specific risk factors (e.g. pain severity), and an increased comorbidity of traditional risk factors (e.g. depression) that contribute to higher rates of suicidal behaviour in chronic pain patients [13, 14]. In a review by Tang et al [11], and a more recent one by Hassett [15] traditional risk factors were found to be associated with suicide behaviours in people with chronic pain. These included: being female, a previous suicide attempt, psychiatric comorbidity, substance use, access to weapons, abuse in childhood and feelings of isolation and hopelessness. Pain-specific factors associated with suicidality included: location and type of pain, severity of pain, length of pain, pain catastrophizing, access to analgesics and sleep problems. It is unclear if the same risk factors for suicide in the general population are independently associated with suicide in people with

chronic pain [11]. Existing suicide research in CNCP populations has involved small samples from clinical settings with a narrow range of patient characteristics.

A recent commentary suggests that previous suicidality research has been limited to comparing the characteristics of people who do and do not attempt suicide and , rather than examining factors that increase the likelihood of someone with suicidal ideation making a suicide attempt [16]. This framework has been termed “ideation-to-action” [16]. To the authors’ knowledge, there have been no studies that have used this ideation-to-action framework in a chronic pain sample.

The Pain and Opioids IN Treatment (POINT) study is a cohort of 1,514 people in the community who have been prescribed strong opioids for chronic pain. POINT provides an opportunity to examine suicidality and chronic pain in a large community-based cohort. The aims of the current paper are to:

1. Estimate the prevalence of suicidal behaviours (ideation and attempts) in a sample of community based chronic pain patients who are taking opioids;
2. Determine the general and pain-specific correlates and predictors of lifetime and suicidal ideation in the past year in people who have experienced suicidal ideation after the onset of their pain;
3. Determine general and pain-specific correlates and predictors of moving from suicidal thoughts to a suicide attempt; and
4. Determine if there are pain specific factors associated with suicidality, over and above general pain factors.

## Materials and Methods

The study was approved by the Human Research Ethics Committee of the University of New South Wales (HREC reference: # HC12149). The study also received A1 Australian National Pharmacy Guild Approval to approach pharmacists to assist with recruitment of participants (Approval n. 815). Full details of the study design have been published elsewhere [17, 18].

### Recruitment

POINT participants were recruited through community pharmacies across Australia and were: 18 years or older; competent in English; mentally and physically able to partake in telephone and self-complete interviews; without serious cognitive impairments; living with chronic non-cancer pain; and taking prescribed Schedule 8 opioids for CNCP for more than 6 weeks. In the current study, chronic non-cancer pain was defined as pain that has persisted for longer than three months. Schedule 8 is an Australian classification of drugs of dependence that are subject to additional regulatory controls regarding their manufacture, supply, distribution, possession and use [19]. Schedule 8 opioids include morphine, oxycodone, buprenorphine, methadone and hydromorphone. A history of injecting drug use (IDU) was not an exclusion criterion, but people currently prescribed pharmaceutical opioids for opioid substitution therapy (OST) for heroin dependence or for cancer were not eligible. Of the 2,091 participants assessed for eligibility, 90% (n=1873) were eligible and 1514 completed the baseline interview (n=201 refused after being deemed eligible and 100 were unable to be contacted). Data was missing for seven people.

Telephone interviews were conducted by trained interviewers, who had a minimum 3-year health or psychology degree, had undergone suicide response training, and were provided with glossaries of chronic pain medications and conditions. Interviews were conducted over the telephone and took approximately one to one and a half hours to complete. A self-

completion survey was also sent to participants who were reimbursed AUD40 for the baseline interview.

## **Measures**

The measures, tools, and domains collected were based on recommendations made under the auspices of the Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (IMMPACT) [20, 21]. Full details of the measures used in the study have been reported elsewhere [17].

### ***Suicidality***

The suicidality questions were based on questions used in the 2007 National Survey of Mental Health and Wellbeing [22]. These questions were adopted from the World Mental Health (WMH) - Composite International Diagnostic Interview (CIDI) [23, 24] suicidality module which has been used extensively in previous international studies [25, 26].

Participants were asked about lifetime and past 12-month presence of suicidal thoughts, plans and attempts. For each of the behaviours, participants were asked for age of onset and age of most recent behaviour. Participants who had made a suicide plan in the past 12-months, or had made a lifetime suicide attempt, were asked about the method used. These were grouped into non-poisoning (fire a gun, carbon monoxide, cut wrists/stab, jump from height, jump in front of train/bus, strangulation/hanging, suffocation, drowning) or poisoning (opioid and non-opioid) methods. People who had made a suicide attempt were asked to select one of three statements. These were: I made a serious attempt to kill myself and it was only luck that I did not succeed; I tried to kill myself, but knew that the method was not fool-proof; and my attempt was a cry for help. I did not intend to die. Suicidality after the onset of pain was determined by using the youngest age of onset for any pain condition and the first age reported for any suicidal behaviour.

### ***Demographic characteristics***

Data on age, sex, marital status and current work status (dichotomised to not unemployed or unemployed) were collected. Net income was binary coded to less than AUD400 and over AUD400, as an income below this cut-is comparable with that from unemployment or disability benefits in Australia.

### ***Pain and pain-related measures***

Participants were asked about chronic pain conditions they had been diagnosed with or suffered from in their lifetime and in the past 12-months. They were also asked the age of onset of the pain condition and how long they had been in pain. Current pain severity and pain interference were measured by the Brief Pain Inventory [27], as a continuous score out of 10. A higher score indicates more pain severity or interference. The Pain Self-Efficacy Questionnaire [28, 29] produced a continuous score out of 60. A higher score indicates greater self-efficacy.

### ***Physical health***

The Short Form 12 (SF12) is based on population norms, with a mean score of 50 and a SD of 10[30]. Sleep patterns were measured using the Medical Outcomes Study (MOS) Sleep scale [31], providing a total score out of 100 on sleep problems, with higher scores indicating greater sleep problems.

### ***Medications***

Self-reported opioid and other medication use were collected in the interview and oral morphine equivalents (OME) were obtained from a medication diary completed over a one week period as part of the self-complete questionnaire mailed to participants. Oral morphine equivalent daily doses were estimated [32] using available references [33-35].



### *Mental health and substance use*

Participants were asked about mental health disorders they have been diagnosed with or that had been problematic in the past 12 months. These included depression, post-traumatic stress disorder (PTSD) and anxiety/panic attacks and borderline personality disorders. Age of onset was also collected. Participants were screened for potential ICD-10 diagnosis of Borderline Personality Disorder (BPD) using the National Survey of Mental Health and Wellbeing version of the CIDI [36].

Participants were asked about lifetime and past 12 month alcohol and illicit drug use. Lifetime drug and alcohol use disorders (using ICD-10 disorders criteria) were assessed via the Composite International Diagnostic Interview (CIDI) [37] alcohol and illicit drug use module.

Social support was measured by the Medical Outcomes Study Social Support Scale (MOS-SS) [38] which provides a score based on a converted average score out of 12 questions. The higher the average score, the higher degree of social support.

Five childhood maltreatment questions were asked, “Before the age of 16, did you experience....” sexual abuse, physical abuse, emotional abuse, physical neglect, emotional and/or the witnessing of any violence. These were based on Sansone (2012 [39]). In the current study we only used data from the sexual, physical and emotional abuse questions. We combined answers to these questions to one variable of ‘any childhood abuse’.



## **General and pain-specific suicide risk factors**

In the current study general and pain-related suicide risk factors were based on previous literature [11, 40]. General suicide risk factors included, age, gender, previous suicide attempt, lifetime and past 12 month depression, anxiety, PTSD, BPD, ICD 10 alcohol use disorder and substance use disorder, history of childhood abuse, lack of social support. Pain-related suicide risk factors included, type and location of pain, pain severity and interference, length of time in pain, number of pain conditions (lifetime and past 12 months), sleep, OME and current prescriptions of benzodiazepines, pain and self-efficacy score and SF12 physical health score.

## **Statistical analysis**

All analyses were conducted using STATA, version 12.0. Proportions, means and standard deviations were reported for normally distributed data and Odds Ratios (OR) with 95% Confidence Intervals (CI) were used to compare groups. Where data were non-normally distributed, medians, inter-quartile ranges were reported and Hedges G effect sizes with 95% CI were used to compare groups. For gender comparisons logistic regression (95%CI) and Hedges G effect sizes were used at  $<0.05$  level of significance. Only participants who had experienced suicidality after their onset of chronic pain were included in regression analyses. Correlates and predictors of lifetime ideation and attempt were examined only for those who had experienced suicidality after the onset of their pain, so that associations between pain and suicidality would be more accurate. To examine the ideation-to-action framework, comparisons were made between those who had ideation but no attempt and those who had made an attempt.

Four multivariate regressions were planned to examine lifetime and past 12 month, suicidal thoughts and ideation-to-action. Univariate analyses were conducted to determine which

factors were to be entered in the multivariate. All variables significant at the univariate level ( $p < 0.05$ ) were entered into a multivariate model. Age, gender and depression were included in the models even if they were not significant at univariate level. As four multivariate regressions were planned, a conservative approach to significance ( $p < 0.01$ ) was used.

Secondary analyses were conducted on multivariate regressions for model comparisons to examine the contribution of pain-specific factors over and above general suicide risk factors.

Bayesian information criterion (BIC), which indicates the best fit of separate models to the overall fit of a regression (a lower BIC indicates a better fit, without overfitting), and pseudo  $R^2$  were used to examine the contribution of pain specific factors to suicide ideation and suicide attempts in nested regressions. Significant variables at the univariate levels (0.05) were split into general and pain specific risk factors and the contribution of pain-specific factors (Model 2), over and above general suicide risk factors (Model 1) was compared.

## **Results**

### ***Overall characteristics of the cohort***

The POINT study included 1,514 people, 44% of whom were male with a mean age of 58 years (SD 13.7). Forty-eight percent of the sample were unemployed and 31% were retired. Sixty-four percent of the sample reported that their employment status had changed due to their pain condition. Fifty-four percent reported a weekly income of AUD399 or less, (equivalent to the single aged or disability pension).

The average pain duration was 10 years (IQR=4.5-20) and participants reported taking pharmaceutical opioids continuously for a median of 4 years (IQR=1.5-10). The average daily oral morphine equivalent dose was 75mg (IQR=36mg-150mg). Fifty-two percent of the sample concurrently took anti-depressants, 34% benzodiazepines and 6.7% antipsychotics.

### ***Prevalence and characteristics of suicidality in the cohort***

Lifetime suicidal ideation was reported by 45.9% of the cohort and 20.0% in the past 12 months (Table 1). Suicidal ideation occurred after the onset of pain in 36.5% of the sample. Only 10.0% the sample experienced ideation before their pain condition, which is similar to the lifetime prevalence of suicidal thoughts in the general population [25]. There were no gender differences in prevalence of suicidal ideation.

**Insert Table 1 here**

A lifetime suicide attempt was reported by 20.3% of the cohort (an average of two attempts) and 2.5% had attempted suicide in the past 12 months. Females were more likely than males to report a lifetime attempt (OR 1.40, 95%CI 1.08-1.89) and to have made an attempt after the onset of their pain (OR 1.43, 95%CI 1.08-1.90). There were no gender differences in the prevalence of attempts in the past 12 months. There were also no gender differences in non-poisoning attempts, although females were more likely than males to plan an attempt by poisoning (OR1.77, 95%CI 1.20-2.62).

### ***Correlates and predictors of lifetime and past 12-month suicidal ideation***

Participants who reported suicidal ideation (Table 2)after the onset of their pain, had significantly greater odds of a range of mental health and substance use disorders. Participants who experienced suicidal ideation in the past 12 months also reported a higher pain score, more pain interference and a lower pain self-efficacy score, than patients who did not report ideation in the past 12 months (Table 3).

**Insert table 2 here**

Variables significant at 0.05 in univariate analyses were entered into a multivariate regression for both lifetime and past 12 month suicidal ideation. In multivariate analyses (Table 2), participants who experienced lifetime suicidal ideation, after the onset of their chronic pain, were more likely to have been diagnosed with depression (AOR 3.87, 95%CI 2.26-6.63), to have screened positive for Borderline Personality Disorder (AOR 3.05, 95%CI 1.80-5.15) and to report childhood abuse (AOR 1.76, 95%CI 1.15-2.70). None of the pain-related factors remained significantly associated with lifetime ideation in the multivariate model.

**Insert table 3 here**

In multivariate analysis for past 12 month suicidal ideation (Table 3) amongst people who experienced suicidality after the onset of their pain, participants who experienced past 12 month suicidal ideation were more likely to report past 12 month depression (AOR 4.07, 95%CI 1.88-8.78). They were also more likely to have made a lifetime suicide attempt (AOR 4.82, 95%CI 2.43-9.56). No pain-related factors remained significant in the multivariate regression.

***Correlates and predictors of lifetime and past 12 month ideation-to-action***

Participants who experienced a lifetime or 12 month suicide attempt were compared to those that had experienced suicidal ideation but not made an attempt to examine factors that increased the chance of an attempt. In univariate analyses, lifetime ideation-to-action was significantly ( $p < 0.05$ ) associated with being male, not married or in a de facto relationship, income below AUD400 per week, having back/neck problems, and a greater number of lifetime pain conditions than those with ideation only (Table 4). Lifetime ideation-to-action was also significantly associated with each of the lifetime mental health disorders assessed and the experience of childhood abuse.

**Insert Table 4 here**

In univariate analyses (Table 5), past year ideation-to-action was significantly ( $p < 0.05$ ) associated with a lower pain and self-efficacy score, poorer physical health, 12 month anxiety and PTSD compared with those who had experienced past 12 month ideation only.

Again, variables significant at the univariate level (0.05) were entered into a multivariate logistic regression. Lifetime ideation-to-action was more likely in participants with incomes below AUD400 per week (AOR 2.21, 1.19-4.12), lifetime anxiety (AOR 1.93, 95%CI 1.00-3.72), borderline personality disorder (AOR 2.75, 95% CI 1.45-5.22) compared with those that experienced lifetime ideation only (Table 4).

In multivariate analyses a past year ideation-to-action was significantly ( $p < 0.01$ ) more likely in those with a lower pain self-efficacy score compared with those with ideation alone (AOR 0.94, 95%CI 0.88-0.98) (Table 5). When past 12 month history of depression was added to the multivariate analyses to determine whether it had any association it remained non-significant.

**Insert Table 5 here**

***Contribution of pain-specific factors over and above general suicide risk factors.***

A nested regression was conducted to determine whether pain-related risk factors were independently associated with suicidality, over and above general-suicide risk factors (not shown). Significant variables at the univariate level were entered into the nested regression for each of the four multivariate regressions on suicidality. General-suicide factors were entered in Model 1 and pain-specific factors in Model 2 to determine the contribution of pain-specific factors. In past 12 month suicidal ideation, Model 1, general-suicide risk factors (BIC 546.51, Pseudo  $R^2$  0.31) was the better fit, compared with the addition of Model 2, pain-specific suicide risk factors (BIC 585.06, Pseudo  $R^2$  0.34). In past 12 month ideation-to-

action Model 2, with the addition of pain-specific risk factors was the better fit (BIC 181.37, Pseudo  $R^2$  0.15) over and above general suicide risk factors (BIC 182.15, Pseudo  $R^2$  0.09).

## **Discussion**

There were a number of important findings from the current study. Firstly, suicidality was common amongst patients prescribed strong opioid medications for CNCP. Secondly, the adoption of the ideation-to-action framework in a chronic pain population found notable differences between those who experienced only ideation and those in the ideation-to-action group. Thirdly, pain-specific factors were associated with past 12 month attempts, over and above general suicide risk-factors. These findings contribute significantly to our growing understanding of chronic pain and suicidality.

### ***Prevalence of suicidal behaviours in a sample of community based chronic pain patients who are taking opioids***

Consistent with previous research [40-42], there were much higher rates of all forms of suicidality in the chronic pain cohort than in the general population[43]: lifetime suicidal ideation (45.9% vs 13.3%, respectively), lifetime suicide attempts (20.3% vs. 3.2%), past 12 month ideation (20.0% vs 2.3%) and past 12 month suicide attempt (2.5% vs. 0.4%).

Joiner's Interpersonal Theory of suicide (IPT)[44] provides some answers to the high rates of suicidal behaviours in people with CNCP. Joiner's IPT proposes that perceived burdensomeness and low belongingness are associated with suicidal desire whereas the capability to act on the desire is acquired over time. The impact of chronic pain on an individual's employment, physical functioning and quality of life [18], and the reliance on others that were prevalent in this population provides a plausible explanation of the high levels of suicidal desire in this group [14]. Additionally, many people live with CNCP for a



number of years and often fail to receive complete relief for their pain through medications or other treatments. This may explain why some CNCP develop the capability to act on this suicidal desire over time.

Interestingly, there were a number of gender findings in the current study which were inconsistent with the general suicide risk literature. Although females were more likely to report suicide by poisoning, there were no gender differences in the use of non-poisoning means (strangulation, shooting, drowning, jumping from a height etc...). Whilst female preference for poisoning is supported in the literature, generally males have been found to prefer violent methods. It is interesting to note that, whilst women preferred poisoning, the use of non-opioid pills (37%) was preferred over opioid medication (23%), despite all participants having ready access to opioids. Further, the current study found no gender differences in lifetime and past 12 month ideation or attempts. This is inconsistent with general suicide research where females are more likely to report suicidal ideation and attempts compared with males [45]. These findings appear to suggest that the addition of pain interacts with suicidality and gender; however we are unable to test this possibility directly given that all of our participants were living with CNCP.

#### ***Risk factors associated with suicidal ideation***

Although a minority of people with suicidal ideation make an attempt[46] approximately 60% of people who attempt suicide report ideation in the past 12 months [47]. Identification and awareness of who might be at risk is important for clinicians. Consistent with previous research, a past suicide attempt and a diagnosis of depression were associated with suicidal ideation [47, 48].



Pain-specific factors, such as type, duration and severity of pain, that have been associated with suicidality in previous research, were not supported in the current research [11, 40]. In the current cohort, however, 85% of the sample reported more than one lifetime pain condition, and had experienced pain for a mean of 10 years. The prescription of opioids may also be a proxy for chronic pain that is more detrimental and severe than pain in chronic pain patients who have not been prescribed opioids. In a cohort where chronic pain is more entrenched, these pain-specific risk factors appear to be less important.

Whilst a higher OME and/or current prescription of benzodiazepines were not independently associated with suicidal ideation or ideation-to-action, there were, however, a high proportion of participants prescribed benzodiazepines, many of whom were taking them daily [49]. These drugs can be potentially lethal when used in combination with pharmaceutical opioids. Non-opioid poisoning was the most commonly reported method used in a previous suicide attempt. Although restriction of access to potentially lethal means has been found to be an effective measure in reducing suicide attempts [50, 51], amongst a sample of CNCP patients, there is a need to balance effective pain management and the ease of access to other available effective treatments. Because of the high rate of health service utilisation among this group, health professionals are in a good position to monitor patient's pain and suicidal behaviours and make informed decisions about when to prescribe medications (opioids and non-opioids), taking account of possible interactions and dosages, and the potential for overdose.

#### ***Factors associated with moving from ideation-to-action in a chronic pain sample***

In a population where suicidality is high, it is important to be able to identify those that most likely to move from ideation-to-action. The current study provided a novel approach to determine the risk factors associated with ideation-to-action in a cohort of chronic pain patients.

The current findings support the general ideation-to-action findings by Klonsky [16]. Specifically, depression was not a predictor when examining factors that elevate the risk of moving from suicidal ideation to an attempt. Critically, the IPT posits that one of the mechanisms for acquiring the capability for suicide is exposure to trauma (direct or vicarious) and physical pain. There were high rates of childhood abuse, in the current cohort, and these were more elevated in those who engaged in suicidal behaviours. Previous literature has found childhood abuse and neglect to be associated with chronic pain [52] and later engagement in suicidal behaviours [53]. It was an independent risk factor only for lifetime suicidal ideation .

Importantly, the current study found that poorer pain coping skills were associated with a past 12 month suicide attempt. Only in past 12 month attempts were pain-related factors independently associated after controlling for general suicide risk factors. Active, problem-focused coping styles have been found to be associated with a better adjustment to chronic pain [54]. It is promising that coping skills can be effectively modified by psychosocial therapies including, cognitive-behavioural therapy, problem solving therapy, and dialectical behaviour therapy [51]. Again, good access to these treatment options is essential for this population.

#### ***Contribution of pain-specific factors to suicidality***

Chronic pain has been associated with suicidality over and above mental health factors [41, 55]. In the current study pain-specific factors were not independently associated with lifetime or past 12 month ideation or lifetime attempt, as mentioned above, in only past 12 month ideation-to-action were pain-specific suicide risk more important, over and above general suicide risk factors. It may be that in a sample of patients where chronic pain is entrenched and the impact of quality of life has been considerable, there is less variability in these pain-

specific factors . Overall, it is the presence of chronic pain and the associated factors that places the person at high risk for suicidality.

### *Limitations*

There were limitations of the current study that need to be considered. Firstly, the cross-sectional nature of this study means that causality cannot be examined. We examined only those that had experienced suicidality after the onset of their pain partially in order to address this issue. Further, the current paper presents data on suicidal ideation, plans and attempts, not completed suicides. As shown, these factors can differ between each of behaviours. The current study still provides significant insight into risk factors associated with suicidal thoughts and attempts that can aid our identification and prevention of suicidal behaviours. Secondly, the potential biases that may be introduced by the reliance on self-report data needs to be considered. Information on chronic medical illnesses and mental health problems were not verified through patient records. However, the rates of pain conditions and findings were similar to those in previous research [41, 42] and all participants were informed that their responses would be de-identified and confidential. This has been found to enhance the validity of self-reported substance use [56]. It must be noted that there was no objective measure of serious cognitive impairment at screening and although interviewers were trained in interview administration, no reliability checks were carried out. Finally, there is the potential that we did not recruit a representative sample of people prescribed opioids for their chronic pain. In order to investigate this possibility, during recruitment we gathered additional data from a random sample of recruiting pharmacies (n=71) on the characteristics of all their opioid customers during the six week recruitment window of their involvement. We found that of the total number of customers recorded as purchasing opioids in these pharmacies, 52% were female (the POINT cohort was 55% female); and 7% were 18-34 years, 55% 35-64 years and 38% 65+ years (vs. 5%, 62% and 33% respectively, in the POINT cohort). Of these customers, 63% were prescribed oxycodone (vs. 62% in the POINT cohort), 16.5% prescribed morphine (vs. 15% in the POINT cohort), 21% prescribed fentanyl patches (vs. 15% in the POINT cohort) and 24% prescribed buprenorphine patches (vs. 21% in the POINT cohort). Although we cannot be sure that all the opioid customers recorded by these pharmacists had been taking these opioids for chronic pain, and for six weeks or more, the striking similarity in these demographic and opioid prescription characteristics is

reassuring. Further, there were 308 people that were eligible but did not complete the baseline interview, 201 refused after eligibility was determined and 100 were unable to be contacted after eligibility was determined. There was a median age of 58 (IQR 46-71) for those that refused after eligibility, similar to the cohort, and they had been prescribed opioids for a median of 2 years (IQR 1-5 years) compared to the cohort median of 4 years. The 'could not contact' group had a median age of 47.5 years (IQR 40-57) and had been prescribed opioids a median of 2 years (IQR 1-5.8 years). These differences suggest that the 'could not contact' was different to the cohort and the people that did not participate overall had been prescribed opioids over a shorter time-frame compared with the cohort. Without further information it is difficult to determine what these differences might mean. From our previous paper on the characteristics of the cohort [18], it appears as though it is the younger people that have the most complex presentations in terms of mental and physical health comorbidities, so if anything; our cohort representation of the complexity of people with CNCP is an underestimation, though we do not expect any of the associations to be different.

### ***Conclusion***

Suicidality amongst people with CNCP is high. There are different risk-factors associated with ideation and ideation-to-action amongst this sample. Understanding these factors can assist clinicians to determine treatment priorities. People with chronic pain have complex clinical profiles, suffering from not only pain, but also mental health problems, sleep problems, low incomes and low physical functioning. Access and affordability of multidisciplinary treatment options are essential in addressing the multitude of problems experienced by this population.

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## **Declaration of interests**

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**Table 1: Lifetime and Past 12-month suicidal behaviours in the POINT cohort**

	<b>Males % (n=672)</b>	<b>Females %(n=842)</b>	<b>Total %(n=1,514)</b>
<b>Suicidal thoughts</b>			
Ever seriously thought suicide	45.1 (300)	46.5 (386)	45.9 (686)
Median age first thought (Iqr)	36 (24-49)	30 (19-42)	33 (20-45)
Thought suicide past 12 months	20.0 (134)	20.0 (168)	20.0 (302)
Suicidal thoughts after onset pain	37.2 (250)	35.9 (302)	36.5 (552)
<b>Planned suicide</b>			
Ever made a plan for suicide	19.2 (129)	22.8 (192)	21.2 (321)
Age first plan	38 (25-48)	30 (19-41)	33 (21-45)
Age last plan	45 (35-55)	39 (30-50)	42.5 (30-54)
Made a plan in past 12 months	6.1 (41)	6.8 (57)	6.5 (98)
<b>Planned method**</b>			
Non-poisoning means	65.8 (25)	37.1 (13)	50.6 (37)
Poisoning			
Any	21.0 (8)	60.0 (21)	39.7 (29)
Take non-opioid pills	10.5 (4)	37.1 (13)	23.3 (17)
Overdose on opioids	10.5 (4)	22.9 (8)	16.4 (12)
Overdose on heroin	5.2 (2)	0	2.7 (2)
Other	7.9 (3)	2.8 (1)	5.4 (4)
<b>Attempt suicide</b>			
Ever attempt suicide	17.3 (116)	22.7 (191)	20.3 (307)
Number of lifetime attempts	2 (1-3)	2 (1-3)	2 (1-3)
Age first attempt	30 (20-42)	28 (18-38)	29 (20-40)
Age last attempt	37 (29-51)	30.5 (25-45)	35 (27-48)
Suicide attempt after onset of pain	13.7 (92)	18.5 (156)	16.4 (248)
Attempted suicide past 12 months	2.2 (15)	2.7 (23)	2.5 (38)
<b>Method of suicide attempt</b>			
Non-poisoning means	44.6 (33)	26.3 (31)	27.6 (20)
Poisoning			
Any	52.7 (39)	72.0 (85)	65.1 (125)
Take non-opioid pills	32.4 (24)	60.2 (71)	50.0 (96)
Overdose on opioids	20.3 (15)	11.9 (14)	15.1 (29)
Overdose on heroin	2.7 (2)	0	1.0 (2)
Other	5.4 (4)	1.7 (2)	3.1 (6)
<b>Suicide statements</b>			
Serious attempt	55.0 (61)	47.4 (91)	50.2 (152)
Tried to kill myself, knew it wasn't fool-proof	24.3 (27)	17.2 (33)	19.8 (60)
Cry for help	20.7 (23)	35.4 (68)	30.0 (91)

\*\* of those that planned/attempted

Non-poisoning includes: Fire a gun, Carbon monoxide, Cut wrists/stab, Jump from height, Jump in front of train/bus, Strangulation/hanging, Suffocation, Drowning

**Table 2: Correlates and predictors of lifetime suicidal ideation in people that experienced ideation after the onset of their pain**

	Lifetime ideation				
	No N=962	yes N=552	OR (95%CI) Hedges G (95%CI)	Adj OR (99%CI) N=978**	Adjusted P value
<b>General suicide risk factors</b>					
<b>Demographics</b>					
Median age (IQR) <sup>†</sup>	61 (51-70)	53 (45-61)	0.57 (0.46-0.67)**	0.99 (0.97-1.01)	0.063
Male (%)	43.9	45.3	0.94 (0.76-1.17)	0.82 (0.52-1.30)	0.266
% married or de facto	56.2	49.1	0.75 (0.61-0.93)**	0.89 (0.59-1.35)	0.471
% Unemployed	39.8	64.1	2.70 (2.18-3.35)***	1.48 (0.95-2.30)	0.024
% income below AUD400	54.4	53.3	0.96 (0.76-1.18)		
<b>Mental health</b>					
% Lifetime depression	52.5	87.5	6.33 (4.78-8.40)***	<b>3.87 (2.26-6.63)</b>	<b>&lt;0.001</b>
% Lifetime PTSD	10.4	28.3	3.40 (2.57-4.48)***	1.56 (0.93-2.63)	0.026
% Lifetime anxiety	26.1	56.7	3.71 (2.97-4.63)***	1.49 (0.96-2.31)	0.019
% Borderline personality disorder	8.04	36.8	6.66 (4.64-9.55)***	<b>3.05 (1.80-5.15)</b>	<b>&lt;0.001</b>
% experiencing childhood abuse	36.9	61.4	2.72 (2.19-3.38)***	<b>1.76 (1.15-2.70)</b>	<b>0.001</b>
<b>Lifetime substance use</b>					
AUD use disorder	26.2	38.6	1.77 (1.41-2.21)***	0.91 (0.57-1.47)	0.619
Substance use disorder	27.8	37.7	1.57 (1.25-1.97)***	1.42 (0.87-2.30)	0.062
<b>Pain-specific factors</b>					
Median months living with pain <sup>#</sup> (IQR)	120 (48-240)	144 (60-276)	-0.07 (-0.18-0.03)		
% Lifetime Back or neck problems	78.1	82.3	1.30 (1.00-1.70)		
% lifetime Frequent/severe headaches	37.9	56.9	2.16 (1.74-2.67)***	1.29 (0.79-2.10)	0.181
% Lifetime Fibromyalgia	7.2	13.10	1.95 (1.27-3.01)**	0.99 (0.48-2.07)	0.984
Median no. pain conditions lifetime <sup>†</sup> (range)	3 (2-3)	3 (2-4)	-0.33 (-0.43—0.22)*	1.13 (0.91-1.39)	0.151

<sup>†</sup>Hedges' g effect size (95%CI)

\*\*Out of 1,514 978 had completed the Borderline Screener, so multivariate regression was reduced to n=978

**Table 3: Correlates and predictors of past 12 month suicidal ideation in people with chronic pain**

	Past 12 month ideation				
	No N=1211	Yes N=302	OR (95%CI) Hedges G (95%CI) <sup>+</sup>	Adj OR (99%CI)	Adj p value
<b>General suicide risk factors</b>					
<i>Demographics</i>					
Median age (range) <sup>+</sup>	60 (49-69)	52 (43-59)	0.60 (0.47-0.73)**	0.99 (0.96-1.01)	0.172
Male (%)	55.6	55.6	1.01 (0.79-1.30)	0.95 (0.49-1.87)	0.854
% married or de facto	55.2	47.4	0.72 (0.57-0.94)*	0.85 (0.44-1.66)	0.536
% unemployed	44.1	66.9	2.55 (1.96-3.33)***	1.34 (0.64-2.78)	0.304
% income below AUD400 per week	55.0	50.0	0.82 (0.64-1.06)		
<i>Mental health</i>					
% 12m depression	30.9	79.1	8.47 (6.25-11.46)***	<b>4.07 (1.88-8.78)</b>	<b>&lt;0.001</b>
% 12m anxiety	19.4	50.0	4.16 (3.18-5.43)***	1.17 (0.56-2.46)	0.578
% 12m PTSD	7.3	23.5	3.87 (2.75-5.46)***	1.35 (0.57-3.17)	0.371
% Borderline	11.5	46.2	6.63 (4.56-9.62)***	1.72 (0.83-3.55)	0.054
% reporting a history of childhood abuse	41.3	64.2	2.57 (1.96-3.32)***	1.16 (0.59-2.78)	0.570
Lifetime suicide attempt	12.5	51.3	7.35 (5.54-9.75)***	<b>4.82 (2.43-9.56)</b>	<b>&lt;0.001</b>
MOS social support <sup>+</sup>	3.4 (2.5-4.1)	2.8 (1.8-3.6)	0.53 (0.39-0.67)**	1.01 (0.75-1.37)	0.922
<i>Past 12m substance use</i>					
% Alcohol...	60.5	60.6	1.00 (0.78-1.30)		
% substance use...	2.6	4.1	1.5 (0.76-2.95)		
<i>Pain-related factors</i>					
Median months living with pain <sup>+</sup> (range)	120 (54-240)	126 (60-264)	0.04 (-0.08-0.17)		
Back or neck problems	75.8	79.5	1.23 (0.91-1.68)		
Frequent/severe headaches	63.0	56.0	0.75 (0.58-0.96)*	1.22 (0.55-2.73)	0.525
Fibromyalgia	5.3	8.3	1.61 (1.00-2.17)*	0.43 (0.13-1.38)	0.063
Median no. pain conditions 12m <sup>+</sup> (range)	2 (1-3)	3 (2-3)	-0.34 (-0.47—0.22)*	1.12 (0.78-1.60)	0.434
<i>Current pain</i>					
BPI pain score (BPI) <sup>##</sup> (SD)	5.0 (1.8)	5.5 (1.6)	1.20 (1.11-1.30)***	0.87 (0.68-1.11)	0.133
Pain Interference (BPI) <sup>##</sup> (SD)	5.4 (2.2)	7.0 (2.0)	1.46 (1.35-1.56)***	1.20 (0.96-1.50)	0.033
Pain Coping and Self Efficacy <sup>##</sup> (SD)	30.8 (13.5)	23.2 (12.0)	0.96 (0.95-0.97)***	1.00 (0.96-1.03)	0.823
<i>Physical health</i>					
Sleep problems (mean)	44.4 (20.1)	59.0 (19.7)	1.03 (0.03-1.04)***	1.01 (1.00-1.04)	0.027
SF12 physical health <sup>+</sup>	26 (22-31)	27 (24-32)	-0.14 (-0.28-0.00)		
<i>Medications</i>					
OME <sup>+</sup>	67.5 (33.2-136.5)	90 (45-171.43)	-0.18 (-0.33 - - 0.04)*	1.00 (1.00-1.00)	0.776
Current benzodiazepines	30.2	49.3	2.25 (1.74-2.91)***	0.91 (0.46-1.80)	0.717

**Table 4: Ideation-to-action in people that experienced a lifetime attempt after the onset of their pain**

	Lifetime ideation-to-action				
	No N=304	Yes N=248	OR (95%CI) Hedges G (95%CI)	Adj OR (99%CI) n=356	Adj p value
<b>General suicide risk factors</b>					
<i>Demographics</i>					
Median age (IQR) <sup>†</sup>	53.5 (46-61)	53 (43-59.5)	0.18 (0.010-0.24)*	1.00 (0.97-1.03)	0.989
Male (%)	52.0	37.1	1.84 (1.30-2.58)**	1.55 (0.82-2.94)	0.077
% married or de facto	54.9	41.9	0.59 (0.42-0.83)**	0.66 (0.36-1.22)	0.085
% Unemployed	60.5	68.6	1.42 (1.00-2.02)		
% income below AUD 400	48.0	59.7	1.60 (1.14-2.25)**	<b>2.21 (1.19-4.12)</b>	<b>0.001</b>
<i>Mental health</i>					
Ever diagnosed with...					
Depression	82.8	94.3	3.46 (.87-6.41)***	1.61 (0.52-4.93)	0.276
PTSD	25.4	34.5	1.54 (1.06-2.24)*	1.12 (0.57-2.20)	0.672
Anxiety	46.0	70.5	2.79 (1.96-3.99)***	<b>1.93 (1.00-3.72)</b>	<b>0.010</b>
Borderline Personality disorders	26.1	50.3	2.86 (1.84-4.47)***	<b>2.75 (1.45-5.22)</b>	<b>&lt;0.001</b>
% experiencing childhood abuse	55.6	68.6	1.74 (1.22-2.47)**	1.15 (0.59-2.22)	0.593
<i>Lifetime substance use</i>					
AUD use disorder	35.5	42.3	1.33 (0.94-1.88)		
Substance use disorder	36.5	39.1	1.11 (0.79-1.58)		
<b>Pain-specific factors</b>					
Median months living with pain <sup>†</sup> (IQR)	132 (60-264)	144 (66-276)	-0.11 (-0.27-0.06)		
% Lifetime back or neck problems	78.3	87.1	1.87 (1.18-2.97)**	1.47 (0.63-3.38)	0.239
% lifetime frequent/severe headaches	53.3	61.3	1.38 (0.99-1.95)		
% lifetime Fibromyalgia	10.5	16.5	1.69 (0.91-3.13)		
Median no. pain conditions lifetime <sup>†</sup> (range)	3 (2-4)	3 (2-4)	-0.26 (-0.43—0.09)*	1.05 (0.82-1.35)	0.619

<sup>†</sup>Hedges' g effect size (95%CI)

\*\*Out of 552, 356 had completed the Borderline Screener, so multivariate regression was reduced to n=356

**Table 5: Past 12 month ideation-to-action in pe with chronic pain**

	Past 12m ideation-to-action				
	No N=268	Yes N=38	OR (95%CI) Hedges G (95%CI)*	Adj OR (99%CI)	Adj P value
<b>General suicide risk factors</b>					
<i>Demographics</i>					
Median age (range)*	52 (43-59.5)	50.5 (42-57)	0.20 (-0.14-0.54)	0.99 (0.94-1.04)	0.615
Male (%)	44.8	39.5	1.24 (0.62-2.49)	1.10 (0.32-3.74)	0.838
% married or de facto	48.9	39.5	0.68 (0.34-1.36)		
% unemployed	64.9	79.0	2.03 (0.89-4.60)		
% income below AUD400 per week	48.9	60.5	1.60 (0.80-3.21)		
<i>Mental health</i>					
% 12m depression	77.6	84.2	1.53 (0.61-3.85)		
% 12m anxiety	16.3	71.1	2.85 (1.35-5.98)**	2.85 (0.72-11.20)	0.049
% 12m PTSD	21.3	36.8	2.16 (1.05-4.44)*	2.27 (0.70-7.41)	0.074
% Borderline Personality Disorder	46.2	54.6	1.39 (0.57-3.40)		
% reporting a history of childhood abuse	63.8	63.2	0.97 (0.48-1.97)		
Lifetime suicide attempt	45.2	100			
MOS social support Mean (SD)	2.91 (1.8-3.6)	2.6 (1.6-3.4)	0.25 (-0.12-0.63)		
<i>Past 12m substance use</i>					
% Alcohol...	61.9	52.6	0.68 (0.34-1.35)		
% substance use...	4.1	2.6	0.63 (0.08-5.03)		
<b>Pain-specific factors</b>					
<i>Pain factors</i>					
Median months living with pain (range)*	138 (60-264)	96 (36-234)	0.17 (-0.17-0.51)		
12m Back or neck problems (%)	78.4	86.8	1.82 (0.68-4.88)		
12m Frequent/severe headaches (%)	57.1	47.4	0.67 (0.34-1.33)		
12m Fibromyalgia (%)	9.0	2.6	0.27 (0.04-2.09)		
Median no. pain conditions 12m* (range)	3 (2-3)	3 (1-3)	0.11 (-0.23-0.44)		
BPI pain score (BPI) <sup>##</sup> (SD)	5.5 (1.7)	5.8 (1.5)	1.11 (0.90-1.38)		
Pain Interference (BPI) <sup>##</sup> (SD)	2.9 (2.0)	7.3 (1.9)	1.16 (0.94-1.42)		
Pain Coping and Self Efficacy <sup>##</sup> (SD)	23.9 (11.8)	18.0 (12.1)	0.96 (0.93-0.99)*	<b>0.94 (0.88-0.98)</b>	<b>0.006*</b>
<i>Physical health</i>					
Sleep problems Mean (SD)	59.3 (19.3)	57.3 (22.9)	0.00 (0.02-0.01)		
SF12 physical health* Median (IQR) <sup>+</sup>	26.9 (24.2-32.4)	24.7 (22.2-29.0)	0.44 (0.06-0.82)**	0.98 (0.88-1.10)	0.633
<i>Medications</i>					
OME <sup>++</sup>	90 (45-163.9)	90.9 (30-217.5)	0.05 (-0.34-0.44)		
Current benzodiazepines	47.8	63.2	1.88 (0.93-3.78)		

<sup>+</sup> Oral morphine equivalents

<sup>\*</sup> Hedges' g effect size (95%CI)