Self-management of pain among people who inject drugs in Vancouver

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SUMMARY

Aims—To evaluate factors and methods associated with self-management of pain among people who inject drugs (IDUs) in Vancouver (Canada).

Patients & methods—This cross-sectional study used bivariate statistics and multivariate logistic regression to analyze self-reported responses among 483 IDUs reporting moderate-to-extreme pain in two prospective cohort studies from 1 December 2012 to 31 May 2013.

Results—Median age was 49.6 years (interquartile range: 43.9–54.6 years), 33.1% of IDUs were female and 97.5% reported self-management of pain. Variables independently and positively associated with self-managed pain included having been refused a prescription for pain medication (adjusted odds ratio: 7.83; 95% CI: 1.64–37.3) and having ever been homeless (adjusted odds ratio: 3.70; 95% CI: 1.00–13.7). Common methods of self-management of pain included injecting heroin (52.7%) and obtaining diverted prescription pain medication from the street (65.0%).

Conclusion—Self-management of pain was common among IDUs who reported moderate-to-extreme pain in this setting, particularly among those who had been refused a prescription for pain medication and those who had ever been homeless. These data highlight the challenges of adequate pain management among IDUs.

Injection drug use is associated with a host of health-related illnesses and harms, which are often a source of physical pain that can result in significantly reduced quality of life and decreased levels of function [1–3]. Appropriate pain management of people who inject drugs (IDUs) can play an important role in improving quality of life, decreasing lengths of hospital stays, reducing the frequency of readmission for patients who self-discharge from hospital

against medical advice and increasing patient confidence in the medical system, thereby enhancing the potential for successful treatment of addiction [4,5].

However, pain among IDUs has many possible etiologies and contributors that pose substantial challenges for patients and clinicians. For instance, pain among IDUs may be caused by illnesses or injuries that are either acute (e.g., trauma and local infections) or chronic (e.g., HIV, hepatitis C and chronic venous insufficiency); drug withdrawal (which increases pain response, decreases pain tolerance and may be associated with painful symptoms, such as abdominal cramps, myalgias or bone pain); or psychiatric (e.g., affective disorders, such as depression or anxiety that may create a more severe pain experience) [2–4]. In many instances, such sources of pain may have been caused by the harms associated with injection drug use in the first place, such as cellulitis and soft tissue infections from injection using unsanitary syringes, or HIV/HCV infection from injection using contaminated syringes [6–8]. Furthermore, some individuals with long-term opioid dependence may have developed lower pain thresholds and reduced tolerance for pain [9].

Additionally, pain is difficult to objectively assess and treat in the clinical setting because it may be manifested uniquely in each individual as a subjective emotion, sensation or experience [4,10], as described by the International Association for the Study of Pain, which defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" [101]. Furthermore, clinicians often lack clear evidence-based guidelines for prescribing analgesia among patients with a history of addiction or substance use [10], despite the existence of related basic management principles and guidelines in the literature [11–14]. As a result, IDUs are significantly more likely to receive inadequate pain relief [1]. Concerns that inhibit physicians' willingness to prescribe analgesia to drug users include the potential risks for dependence, misuse or diversion [10,15]. In particular, clinical guidelines of the American Pain Society and the American Academy of Pain Medicine warn that the potential risks of misuse, abuse and addiction may warrant restrictions on prescribing opioids outside of specialized and controlled settings for some patients with a history of substance abuse [14]. Additionally, clinicians may misinterpret requests for pain medication from an IDU as 'drug-seeking' [2,16]. All of these factors may contribute to the undertreatment of pain among IDUs. Consequently, IDUs often feel stigmatized or mistreated [2,16,17] and may resort to self-managing their pain.

While a limited body of literature has documented the perspectives of drug users who struggle with clinical pain management [1,16], little is known about the frequency of and strategies for self-management of pain among IDUs. Therefore, we sought to investigate the prevalence, correlates and methods of self-managed pain among a community-recruited cohort of IDUs in Vancouver (Canada).

Methods

Subjects

Beginning in May 1996, persons who had injected illicit drugs at least once in the previous month and resided in the Greater Vancouver region were recruited into one of two ongoing prospective observational cohorts: the AIDS Care Cohort to Evaluate Access to Survival Services (ACCESS) cohort of HIV-seropositive IDUs or the Vancouver Injection Drug Users Study (VIDUS) of HIV-seronegative IDUs. These cohorts have been described in detail previously [18–20]. In total, over 2500 subjects have been recruited through snowball sampling and extensive street outreach methods. Individuals were eligible for the studies if they were aged 18 years or older and provided written informed consent. At baseline and semi-annually, participants answered a standardized interviewer-administered questionnaire

and provided blood samples for serologic analysis (among HIV-negative individuals) and disease monitoring (among HIV-positive individuals). At the end of each study visit, participants were provided with a monetary stipend of CAD$20 and any necessary referrals for medical care, HIV/AIDS care or drug and alcohol treatment. Each questionnaire was scrutinized by at least two trained interviewers, and any logical inconsistencies resolved before being entered. The data entry program used to enter questionnaire data included data quality and verification checks, including field range limits and logical checks. Participants have been followed prospectively in this ongoing study with no defined end point. These studies have received ethics approval from the University of British Columbia (Vancouver, Canada) and Providence Health Care Office of Research Services (Vancouver, Canada).

Measures

The present analysis was restricted to interviews that took place during a single follow-up period from 1 December 2012 to 31 May 2013. We restricted our sample to active IDUs who reported moderate-to-extreme pain according to the standardized Euroqol EQ-5D health utility instrument, which has been shown to be a valid, responsive and reliable survey instrument among individuals with chronic pain and substance users [21–23]. In order to identify IDUs who have ever self-managed pain, the following question from the standardized interviewer-administered questionnaire was asked of all current injectors who reported moderate-to-extreme pain during this follow-up period: 'Have you ever managed your own pain?' Participants who responded 'No' (i.e., participants who reported having never self-managed pain) were not asked any further questions regarding pain. Participants who responded 'Yes' (i.e., participants who reported having previously managed their own pain) were subsequently asked how they self-managed their pain through the question, 'If yes, how?' Participants were able to respond *ad libitum* to this question, with more than one response if desired.

We compared those who did and did not report self-management of pain to identify the factors associated with self-management of pain. The sociodemographic characteristics and other factors considered in the analyses were: age, gender, homelessness, unstable housing, residence in Vancouver's Downtown Eastside, education status, HIV status, sex work, incarceration, having a physical disability and having ever been refused pain medication. The latter variable was derived from the questions: 'Have you ever requested a prescription for pain medication?' then 'If yes, were you ever refused a prescription?' The variables related to drug use included: daily noninjection crack use, daily crystal meth injection, daily heroin injection, daily cocaine injection, daily marijuana use, heavy alcohol use, prescription opioid abuse, having ever enrolled in methadone maintenance treatment, having ever overdosed and binge injection drug use. Unless otherwise indicated, these sociodemographic and drug-using variables pertain to the previous 6 months prior to the time of interview. Heavy alcohol use was defined as an average of more than two drinks per day or more than 14 drinks per week over the past 6 months for males, or an average of more than one drink per day or more than seven drinks per week over the past 6 months for females [24–26]. Prescription opioid abuse was defined as the use of prescription opiates not as prescribed (e.g., exceeding the prescribed dose, injecting or crushing medications) or the use of prescription opiates not prescribed to the individual [27]. In order to capture overdoses resulting from various types of illicit drugs, including stimulants, the overdose variable was defined using a 'Yes' or 'No' response to the question, 'In the last 6 months, have you overdosed by accident (i.e., where you had an unexpected negative reaction from using too much drugs)?' Finally, binge injection drug use was defined as periods of time during which drugs were injected more frequently than usual, as per the definition of bingeing in previous studies [28,29].

Statistical analysis

Using these variables, we analyzed which factors were associated with self-management of pain using bivariate statistics and multivariate logistic regression analyses. Categorical variables were analyzed using Pearson's χ^2 test and Fisher's exact test (when one or more cells contained values less than or equal to five), and continuous variables were analyzed using simple logistic regression. We then applied an *a priori*-defined statistical protocol based on examination of the Akaike information criterion (AIC) and p-values to construct an explanatory multivariate logistic regression model. First, we constructed a full model including variables that were significant at the level of p 0.1 in the bivariate analyses. After noting the AIC of the model, we removed the variable with the largest p-value and built a reduced model. We continued this iterative process until no variables remained for inclusion. We selected the multivariate model with the best overall fit, as indicated by the lowest AIC score. The variables in the final model were assessed with variance inflation factors (VIFs) and condition indices to ensure the absence of collinearity. All p-values were two-sided.

Results

In total, 483 active IDUs reported moderate-to-extreme pain and were eligible for this analysis during a single follow-up period from 1 December 2012 to 31 May 2013. Of these, 323 (66.9%) were men and 160 (33.1%) were women, and 224 (46.4%) were HIV-positive. The median age was 49.6 years (interquartile range: 43.9–54.6 years). The median duration of follow-up in the study among participants in this analysis was 6.2 months (interquartile range: 1.9 months). In total, 471 (97.5%) of active IDUs with moderate-to-extreme pain reported self-managed pain, while 12 (2.5%) active IDUs with moderate-to-extreme pain did not report self-managed pain.

Table 1 shows the sociodemographic characteristics of the participants stratified by those who did and did not self-manage pain. As indicated, having been refused pain medication (odds ratio [OR]: 8.31; 95% CI: 1.80–38.3; p= 0.007) and having ever been homeless (OR: 4.41; 95% CI: 1.28–15.2; p= 0.019) were positively associated with self-management of pain. We found no significant associations between self-management of pain and age, gender, Downtown Eastside residence, unstable housing, education status, HIV serostatus, sex work, incarceration or physical disability.

Table 2 shows the bivariate analyses of variables related to drug use. We found no association between self-management of pain and daily noninjection crack use, daily crystal meth injection, daily heroin injection, daily cocaine injection, daily marijuana use, heavy alcohol use, prescription opioid abuse, enrollment in methadone maintenance treatment, overdose or binge injection drug use.

The multivariate logistic regression analysis of factors independently associated with self-management of pain is shown in Table 3. As shown here, having been refused a prescription for pain medication (adjusted OR [AOR]: 7.83; 95% CI: 1.64–37.3; p = 0.010) and having ever been homeless (AOR: 3.70; 95%CI: 1.00–13.7; p = 0.050) remained positively associated with self-managed pain.

The self-reported methods of self-managing pain are shown in Table 4. As indicated, the most common methods of self-managing pain were injecting heroin (52.7%) and obtaining diverted prescription pain medication from the street (65.0%). The most commonly obtained pain medications from the street were morphine (43.3%), hydromorphone (e.g., Dilaudid®, Purdue Pharma, Ontario, Canada; 31.8%), acetaminophen with codeine (e.g., Tylenol® with Codeine #3, McNeil Consumer Healthcare, Ontario, Canada; 25.3%) and acetaminophen

with oxycodone (e.g., Percocet®, Bristol-Myers Squibb Canada, Quebec, Canada; 13.8%). These were also the most commonly reported pain medications that were obtained from a friend, partner or acquaintance; however, this method of obtaining diverted pain medication was less common (25.1%). Other self-reported methods of self-managing pain included marijuana (21.4%), cocaine (9.1%), crack (8.7%), alcohol (7.9%) and over-the-counter medications such as ibuprofen (12.7%) or acetaminophen (8.9%). A small percentage of participants reported self-management of pain using complementary approaches such as heat (10.2%), exercise (8.3%), or rest or relaxation (8.1%).

Discussion

In this study, we found that a large majority (97.5%) of the recruited active IDUs who reported moderate-to-extreme pain had self-managed their pain within their lifetime. Variables independently and positively associated with self-managed pain included having been refused a prescription for pain medication and having ever been homeless. Pain was most frequently self-managed by injecting heroin or obtaining diverted prescription pain medication from the street.

The high proportion of IDUs that self-manage their pain in this study may be due to inadequate pain management approaches for substance users in the clinical setting, as has been previously described in the literature [30,31]. Much of the focus of the literature on pain management among drug users is on practitioners' experiences managing substance users' pain in clinical settings [2,4,10,15]. While previous literature has characterized pain among patients with a history of substance use in certain clinical settings such as methadone maintenance centers [32], to our knowledge, our study is the first to characterize self-management of pain outside of a clinical setting among a community-recruited sample of IDUs.

Concerns regarding the diversion of pain medications are a key reason why practitioners are often reluctant to prescribe pain medication in the clinical setting [10,15,17]. However, our findings show a strong association between being denied a prescription for pain medication and self-management of pain. This suggests that after being denied pain relief in the clinical setting, IDUs often resort to self-managing their pain using high-risk methods, such as injection drug use or obtaining diverted pain medication within street-based drug markets. While current clinical guidelines of the American Pain Society and the American Academy of Pain Medicine warn that the potential risks of misuse, abuse and addiction may outweigh the benefit of opioid therapy in some patients with a history of substance abuse [14], our findings suggest that clinicians who deny pain medication to those who require it may be inadvertently fuelling the demand for diverted pharmaceuticals. Therefore, further research is needed to develop and evaluate strategies that may facilitate appropriate pain treatment, while limiting the potential for misuse, abuse, addiction or diversion, such as directly observed therapy in controlled and specialized opioid treatment programs [14], tamper-resistant formulations that deter opioid misuse [33], frequent urine drug screen monitoring at primary care clinics [34] or complementary and alternative therapies for injection drug users [35].

We found that IDUs who had ever been homeless were more likely to self-manage their pain. Previous studies of pain management among homeless individuals experiencing pain reveal that acute or chronic pain may be common among homeless populations owing to a high frequency of injuries and high prevalence of comorbidities [36,37]. Furthermore, prior studies demonstrate that perceived barriers to pain management among homeless populations include unstable and stressful living environments, poor sleeping conditions, the inability to afford prescription medications, being offered only over-the-counter pain

medication or perceived inadequate pain assessments by physicians [36–39]. As a result, similar to our findings, homeless participants in other studies have reported self-medication for pain using over-the-counter or prescription medications, illicit drugs or alcohol [37,38]. Therefore, further strategies are needed to promote effective pain assessment and management for homeless patients with limited or unstable resources.

In this study, the most common method of self-managing pain was injecting heroin. While the pain-relieving properties of heroin as an opiate analgesic are well documented, illicit heroin injection for pain is concerning because of the associated risks such as overdose, complications that may further perpetuate the individual's pain (e.g., localized and systemic infections, and infectious disease transmission), and the potential for worsening addiction [40–42]. Indeed, injecting heroin for pain may inhibit efforts to cease injecting or reduce opiate use when continued injection drug use for pain management occurs. While prescription opioids also pose potential for dependence or addiction, close monitoring of opioid analgesia in controlled and specialized settings may promote therapeutic dosing while avoiding additional risks associated with illicit heroin injection, including injection drug use and immersion within illicit drug markets [14].

The second most prevalent method of self-managing pain in this study was obtaining diverted prescription pain medication off the street, particularly morphine, hydromorphone (e.g., Dilaudid), acetaminophen with codeine (e.g., Tylenol with Codeine #3) and acetaminophen with oxycodone (e.g., Percocet). This is consistent with the literature on diverted prescription medications, which has consistently found that opioid analgesics are the most popular diverted medications [43–48]. As demonstrated by an assessment of prescription drug user focus groups [46], individuals may prefer to use diverted pain medications due to the perception that these drugs are less stigmatizing, less dangerous and less subject to legal consequences compared with illicit drugs. On the contrary, the use of diverted pain medication is extremely dangerous as it poses high risks for overdose and toxicity since its administration cannot be monitored for dosing, integrity of ingredients, polydrug interactions or adverse effects that may result in addiction, overdose or death [48].

This study has several limitations. First, the cross-sectional design of the study limited our ability to determine a temporal relationship between the explanatory variables and the outcome. In particular, we were not able to assess antecedent drug use patterns that predicted self-management of pain, although our approach provides some insight into drug-use patterns that may follow self-management of pain. Therefore, the associations noted in this study should be further examined through longitudinal analyses. Second, our study relied on self-reported data that is susceptible to reporting biases, such as socially desirable reporting and recall bias. Third, because the study was conducted in one city in Canada and included participants enrolled through snowball sampling and street outreach rather than random selection, the interpretation of these results may not be generalizable to other IDU populations. Finally, our analysis did not capture methods of pain management or the prevalence of diverted opioid use among IDUs who did not report self-managed pain, which should be considered in future studies.

Conclusion & future perspective

Collectively, these findings indicate the need for improved pain management for IDUs in the clinical setting, as this may serve to reduce the prevalence of self-management of pain in ways that pose high risk for morbidity and mortality. Punitive laws and regulations that deter physicians from prescribing analgesia should be reexamined and alternative strategies employed, such as providing immunity from discipline for physicians who prescribe analgesic medications according to evidence-based guidelines, and education outlining the

complexity of pain management among IDUs, which needs to be widely available to clinicians [4,48]. Currently, basic management principles and guidelines exist [11–14], but may be based on 'low-quality evidence' or 'anecdotal experience' [14], and may not be widely available to clinicians who care for IDU clients. Furthermore, pain and addiction specialists should be involved in acute and non-acute healthcare settings, and medical schools should train physicians to specialize in addiction medicine in order to effectively manage pain among this complex population.

Without novel efforts to improve pain management among drug users, there may be grave consequences that extend beyond the issue of untreated pain, such as: substance users' decreased confidence in the medical system and deepened distrust of health practitioners due to perceived stigma; decreased hope of rehabilitation in terms of the individual's addiction and physical wellbeing; and a likelihood of prolonged addiction as a means of coping with pain [4,17]. Conversely, the effective pain management of IDUs may contribute to increased quality of life, increased function and hope for rehabilitation, and increased likelihood of accessing health and addiction treatment in the future after positive experiences with healthcare practitioners [1,3,4]. Furthermore, patients with a history of substance use may self-discharge or avoid healthcare owing to undertreated pain, particularly in acute care settings [4,15]. Thus, appropriate pain management of IDUs may contribute to reduced healthcare costs by decreasing the number of patients who self-discharge against medical advice and are often hospitalized with more severe and complex problems requiring more intense, prolonged and overall more expensive care [4,15].

In summary, a large proportion of IDUs participating in this study reported a history of self-managed pain. Factors independently and positively associated with self-managed pain included having been refused a prescription for pain medication and having ever been homeless. The most commonly reported methods of self-managing pain included injecting heroin and obtaining diverted prescription pain medication from the street. Our findings indicate the need for novel efforts to improve pain management among IDUs in order to offset the high-risk behaviors associated with self-managed pain.

Acknowledgments

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Practice Points

- People who inject drugs (IDUs) often contend with short-term and chronic pain due to various comorbidities. Clinicians may be reluctant to prescribe pain medications owing to concerns about drug-seeking by IDUs.

- As a result, some IDUs may resort to self-management of pain, although this phenomenon has received little attention.

- The Vancouver Injection Drug Users Study (VIDUS) and the AIDS Care Cohort to Evaluate Access to Survival Services (ACCESS) are two prospective cohort studies of IDUs in Vancouver (Canada).

- Among participants enrolled in VIDUS and ACCESS, we used logistic regression analysis to evaluate factors associated with self-management of pain. We also examined self-reported methods of pain management.

- Four hundred and eighty three IDUs who reported moderate-to-extreme pain were eligible for this analysis, of which 160 (33.1%) were female. Two hundred and twenty four (46.4%) were HIV positive. The median age was 49.6 years (interquartile range: 43.9–54.6 years).

- Self-management of pain was common among IDUs in this cohort, with 471 IDUs (97.5%) reporting self-management of pain.

- Variables independently and positively associated with self-managed pain included having been refused a prescription for pain medication, and having ever been homeless.

- Common methods of self-management of pain included injecting heroin (52.7%) and obtaining diverted prescription pain medication from the street (65.0%).

- Novel efforts to improve pain management for IDUs are necessary. These may include clinical guidelines for pain management among IDUs and involving pain and addiction specialists in healthcare settings.

- Improved pain management for IDUs in the clinical setting may serve to reduce the prevalence of self-management of pain in ways that pose high risk for morbidity and mortality.

Table 1

Bivariate analysis of factors associated with self-management of pain among people who inject drugs in Vancouver (Canada) reporting moderate-to-extreme pain (n = 483).

Characteristic	Self-managed pain[†]		Unadjusted odds ratio (95% CI)	p-value
	Yes: 471 (97.5%)	No: 12 (2.5%)		
Age				
>Median	236 (48.9)	5 (1.0)	1.41 (0.44–4.49)	0.565
Median	235 (48.7)	7 (1.5)		
Gender				
Male	312 (65.6)	11 (2.3)	0.18 (0.02–1.39)	0.100
Female	159 (32.9)	1 (0.2)		
Homelessness[†]				
Yes	423 (87.6)	8 (1.7)	4.41 (1.28–15.2)	0.019
No	48 (9.9)	4 (0.8)		
Unstable housing[‡]				
Yes	281 (60.8)	4 (0.9)	2.89 (0.83–10.0)	0.094
No	170 (36.8)	7 (1.5)		
DTES residence[‡]				
Yes	284 (58.8)	4 (0.8)	3.04 (0.90–10.2)	0.073
No	187 (38.7)	8 (1.7)		
Education status[§]				
High school	241 (51.4)	7 (1.5)	0.80 (0.25–2.55)	0.702
<High school	216 (46.1)	5 (1.1)		
HIV status				
Positive	221 (45.8)	3 (0.6)	2.65 (0.71–9.92)	0.147
Negative	250 (51.8)	9 (1.9)		
Sex work[†]				
Yes	257 (53.2)	8 (1.7)	0.60 (0.18–2.02)	0.410
No	214 (44.3)	4 (0.8)		
Incarceration[‡§]				
Yes	23 (4.8)	1 (0.2)	0.57 (0.07–4.57)	0.593
No	447 (92.7)	11 (2.3)		

Characteristic	Self-managed pain[†]		Unadjusted odds ratio (95% CI)	p-value
	Yes: 471 (97.5%)	No: 12 (2.5%)		
Physical disabilities[‡]				
Yes	307 (63.6)	5 (1.0)	2.62 (0.82–8.39)	0.105
No	164 (34.0)	7 (1.5)		
Refused pain medication[†]				
Yes	294 (60.9)	2 (0.4)	8.31 (1.80–38.3)	0.007
No	177 (36.7)	10 (2.1)		

[†]Ever.

[‡]Within the last 6 months (at time of interview).

[§]Indicates missing responses as follows: education status (14 missing responses); incarceration (one missing response).

DTES: Downtown Eastside.

Table 2

Bivariate analysis of drug use-related factors associated with self-management of pain among people who inject drugs in Vancouver (Canada) reporting moderate-to-extreme pain (n = 483).

Characteristic	Self-managed pain[†]		Unadjusted odds ratio (95% CI)	p-value
	Yes: 471 (97.5%)	No: 12 (2.5%)		
Daily noninjection crack use[‡§]				
Yes	85 (17.7)	2 (0.4)	1.11 (0.24–5.16)	0.894
No	383 (79.8)	10 (2.1)		
Daily crystal meth injection[‡§]				
Yes	25 (5.2)	1 (0.2)	0.62 (0.08–4.98)	0.651
No	445 (92.3)	11 (2.3)		
Daily heroin injection[‡§]				
Yes	58 (12.0)	1 (0.2)	1.55 (0.20–12.2)	0.678
No	412 (85.5)	11 (2.3)		
Daily cocaine injection[‡§]				
Yes	30 (6.24)	1 (0.2)	0.75 (0.09–6.01)	0.788
No	439 (91.3)	11 (2.3)		
Daily marijuana use[‡§]				
Yes	103 (21.5)	2 (0.4)	1.42 (0.31–6.56)	0.197
No	364 (76.0)	10 (2.1)		
Heavy alcohol use[‡]				
Yes	93 (19.3)	1 (0.2)	2.71 (0.35–21.2)	0.344
No	378 (78.3)	11 (2.3)		
Prescription opioid abuse[‡]				
Yes	95 (19.8)	1 (0.2)	2.79 (0.36–21.9)	0.328
No	374 (77.8)	11 (2.3)		
Enrolled in MMT[†]				
Yes	337 (69.8)	6 (1.24)	2.52 (0.80–7.94)	0.116
No	134 (27.7)	6 (1.24)		
Overdose[†]				
Yes	304 (62.9)	7 (1.5)	1.30 (0.41–4.16)	0.658
No	167 (34.6)	5 (1.0)		

Characteristic	Self-managed pain[†]		Unadjusted odds ratio (95% CI)	p-value
	Yes: 471 (97.5%)	No: 12 (2.5%)		
Binge injection drug use[‡][§]				
Yes	94 (19.5)	2 (0.4)	1.25 (0.27–5.80)	0.776
No	376 (78.0)	10 (2.1)		

[†]Ever.

[‡]Within the last 6 months (at time of interview).

[§]Indicates missing responses as follows: daily noninjection crack use (three missing responses); daily crystal meth injection (one missing response); daily heroin injection (one missing response); daily cocaine injection (two missing responses); daily marijuana use (four missing responses); binge injection drug use (one missing response).

MMT: Methadone maintenance treatment.

Table 3

Logistic regression analysis of factors associated with self-management of pain among people who inject drugs in Vancouver (Canada) reporting moderate-to-extreme pain (n = 483).

Variable	Adjusted odds ratio	95% CI	p-value
Refused pain medication[†]			
Yes vs no	7.83	1.64–37.3	0.010
Homelessness[†]			
Yes vs no	3.70	1.00–13.7	0.050
Gender			
Male vs female	0.17	0.02–1.39	0.098

[†]Ever.

Table 4

Self-reported[†] methods of self-management of pain among people who inject drugs in Vancouver (Canada) reporting moderate-to-extreme pain and self-managed pain (n = 471).

Method	n (%), n = 471[†]
Inject heroin	248 (52.7)
Smoke/snort heroin	40 (8.5)
Obtained prescription pain medication from the street:	306 (65.0)
▪ Morphine	204 (43.3)
▪ Hydromorphone (e.g., Dilaudid®, Purdue Pharma, Ontario, Canada)	150 (31.8)
▪ Acetaminophen with codeine (e.g., Tylenol® with Codeine #3, McNeil Consumer Healthcare, Ontario, Canada)	119 (25.3)
▪ Acetaminophen with oxycodone (e.g., Percocet®, Bristol-Myers Squibb Canada, Quebec, Canada)	65 (13.8)
Obtained prescription pain medication from a friend/partner/acquaintance:	118 (25.1)
▪ Morphine	51 (10.8)
▪ Acetaminophen with codeine (e.g., Tylenol with Codeine #3)	49 (10.4)
▪ Hydromorphone (e.g., Dilaudid)	35 (16.4)
▪ Acetaminophen with oxycodone (e.g., Percocet)	17 (7.9)
Other drug use:	
▪ Marijuana	101 (21.4)
▪ Cocaine	43 (9.1)
▪ Crack	41 (8.7)
▪ Alcohol	37 (7.9)
Over-the-counter medication:	
▪ Ibuprofen (e.g., Advil®, Pfizer Canada, Quebec, Canada)	60 (12.7)
▪ Acetaminophen (e.g., Regular Strength Tylenol)	42 (8.9)
Nothing/ignore it/suffer through it/wait for it to pass	96 (20.4)
Heat (e.g., hot bath/shower, hot compress/pad)	48 (10.2)
Exercise	39 (8.3)
Rest/relax/relaxation techniques	38 (8.1)

[†]Participants were able to provide more than one answer.