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## Pain and substance-related pain reduction behaviors among opioid dependent individuals seeking methadone maintenance treatment: An exploratory study<sup>1</sup>

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### Abstract

We surveyed 293 opioid dependent individuals seeking methadone maintenance treatment about their pain experiences and their substance-related pain reduction behaviors. Among the 213 respondents reporting recent pain of at least moderate typical pain intensity, two-thirds had a lifetime history of chronic pain. In comparison to those without a lifetime history of chronic pain, those with a lifetime history were older, reported higher pain frequency, were more likely to endorse accident or surgery and less likely to endorse “don’t know” as the genesis of their recent pain, and endorsed comparable levels of substance-related pain reduction behaviors. These findings may have implications for resource and program planning in MMT programs.

### Keywords

Pain; methadone; opioid-related disorders

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Pain management in methadone maintenance treatment (MMT) represents an important clinical challenge. Prevalence estimates for chronic pain in MMT range from 37% with chronic severe pain to more than 60% with chronic pain of any intensity (1–3). Unrelieved pain is generally—though not always (4)—associated with poorer drug treatment outcomes, including increased non-prescribed use of psychoactive drugs, increased psychiatric distress, and early treatment termination (3,5–8). Moreover, MMT clinicians report frustration and difficulty treating this patient group and experience several clinical management issues (9). One potential hurdle in providing adequate pain management to MMT patients with chronic pain is the possibility that opioid dependence or chronic opiate use may enhance pain sensitivity (10, 11).

Although addiction and chronic pain are often difficult to treat when they exist independently, the likelihood of inadequate or unavailable treatment rises sharply when they co-occur (12, 13). An important step in providing adequate treatment for opioid dependent individuals with pain involves adequately assessing their pain experiences. Recent findings point to the

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importance of assessing recent pain (i.e., pain experienced in the past week) in addition to chronic pain among opioid dependent patients (5).

While some studies have examined pain in patients currently enrolled in MMT, there is a surprising dearth of published research on the pain experiences of opioid dependent individuals seeking entry to MMT. Recently, a unique opportunity for examining the pain experiences of individuals seeking MMT was identified (9). This occurred from the interest of a longstanding MMT program at the APT Foundation Inc. (hereafter referred to as APT), a not-for profit community-based organization located in New Haven, CT, that operates 3 opioid agonist clinics with a census of 1,500 patients, to develop pain management services. The aim of this needs assessment study was to examine the pain experiences of opioid dependent individuals seeking MMT. Specifically, we set out to examine, among those seeking MMT: (a) the prevalence of pain types (i.e., recent pain, lifetime history of chronic pain), (b) the characteristics of pain (intensity, frequency, duration, interference, location, and genesis), and (c) substance-related pain reduction behaviors. Such information might be useful for MMT resource and program planning.

## Methods

Participants were 293 adults who were consecutively evaluated for enrollment to MMT at APT from September 2006 to March 2007 (100% compliance). Participants completed the study survey as part of the screening process at their initial intake appointment. Participants' answers were anonymous and were not linked to their medical charts. Participants were informed that their survey answers would not affect their treatment at APT. This study received appropriate institutional Human Investigation Committee approval.

## Data collection

The study questionnaire was developed by the authors and pilot tested on 3 experienced research assistants, 5 seasoned intake workers, and 10 MMT seekers. The survey was deliberately designed to be brief (< 10 minutes), self-administered, and easy to understand in order to augment compliance and to minimize burden on participants and staff. Survey questions assessed multiple domains, including: (a) the prevalence of pain types (i.e., recent pain, lifetime history of chronic pain), (b) the characteristics of pain (intensity, frequency, duration, interference, location, and genesis), (c) substance-related pain reduction behaviors, and (d) demographics (age, gender, and race).

Recent pain and lifetime history of chronic pain were assessed by asking participants whether they had experienced physical pain in the last week (yes/no) and whether they had ever experienced physical pain that lasted at least three months (yes/no). Pain intensity (current and typical level in the last 7 days) items asked participants to rate how much physical pain they were currently experiencing and the typical level of physical pain experienced in the last 7 days (on similar ordinal scales between 1 [none]/[minimal] to 5 [unbearable]).

Pain frequency assessed how often physical pain was experienced in the last 7 days (on an ordinal scale between 1 [never] to 5 [all the time]). Pain duration assessed the length of the typical pain episode experienced in the last 7 days (on an ordinal scale between 1 [less than one hour] and 5 [all day]). Pain interference assessed the degree to which pain interfered with participants' everyday life (on an ordinal scale between 1 [did not interfere] to 5 [interfered completely]). Pain location assessed where on the participant's body he/she experienced the most bothersome pain, and pain genesis assessed how the pain experienced in the last 7 days began (participants were provided with a list of answer choices for each). The pain location response list included: back, shoulder, pelvis, hands, feet, stomach, head, face, legs, arms, and

“other,” and the pain genesis response list included: accident, surgery, nerve damage, arthritis, HIV, cancer, opioid withdrawal, “don’t know” and “other.”

With respect to history of substance-related pain reduction behaviors, participants were provided with a list of substances that opioid dependent patients in our MMT programs have indicated using for analgesic purposes and were asked, “Which of the following have you used in the last 7 days to help you relieve ongoing physical pain?” The list included: (a) “More than prescribed opiate medication (e.g., Demerol, Fentanyl, Morphine, Oxycontin, Percocet, Percodan, Tylenol with Codeine, etc.),” (b) “Somebody else’s opiate pain medication,” (c) Heroin, (d) “Street methadone,” (e) “More than prescribed non-opiate medication (e.g., Celebrex, Celexa, Clonidine, Depakote, Elavil, Fiorinal, Ketalar, Ketaset, Neurontin, Prozac, Soma, Tegretol, Topamax, etc.),” (f) “Somebody else’s non-opiate pain medication,” (g) “More than prescribed benzodiazepine (e.g., Ativan, Halcion, Klonopin, Valium, Xanax, etc.),” (h) “Somebody else’s benzodiazepine medication,” (i) “Other street drugs (e.g., cocaine, marijuana, etc),” and (j) Alcohol.

## Pain Groups and Pain Subgroups

Respondents’ answers to pain-related items were used to classify them into one of two pain groups: a) “no recent pain” (i.e., no pain reported in the past week) and b) “recent pain” (i.e., pain reported in the past week). Given that methadone clinics that are considering offering pain management services are likely to be interested in targeting those who endorse at least moderate (as opposed to mild or minimal) levels of recent pain intensity or a history of chronic pain, we further subdivided the recent pain group into 2 subgroups: those reporting at least moderate typical pain intensity with and without a lifetime history of chronic pain.

## Data Analysis

Pain group and subgroup differences on demographic, pain, and substance-related pain reduction variables were examined using t-tests for continuous data and Pearson chi-square tests for frequency data. Since the two pain subgroups (i.e., those with and those without a lifetime history of chronic pain) differed significantly on age and race, we performed a multivariate analysis of covariance (MANCOVA) to control for age and race on comparisons involving pain continuous data (i.e., current pain intensity, pain frequency, typical pain duration, and typical pain interference). Statistical significance was set at  $p < 0.05$ . Statistical analyses were performed using SPSS Version 15.0 for Windows (SPSS, Inc., Chicago, IL).

## RESULTS

### Demographic characteristics

Of the 293 respondents, 80% were white, 60% were male, and 88% reported recent pain. Whereas sex and race did not vary by pain group (i.e., no recent pain, recent pain), participants with recent pain were older (mean = 35.7 years) than those with no recent pain (mean = 29.6 years) ( $t = 4.01$ ,  $df = 53$ ,  $p < 0.001$ ). Among the 257 respondents with recent pain, 17% ( $n = 44$ ) characterized their typical pain intensity as minimal or mild, 44% ( $n = 114$ ) as moderate, and 39% ( $n = 99$ ) as severe or unbearable.

As summarized in Table 1, among the 213 respondents reporting recent pain of at least moderate typical pain intensity, those with (67%;  $n = 142$ ) and those without a lifetime history of chronic pain (33%;  $n = 71$ ) did not differ on gender but did differ on race and age: those with a lifetime history of chronic pain were more likely to be white, and were, on average, older. After controlling for multiple comparisons using a Bonferroni correction ( $.05 \div 3 = 0.017$ ), the group difference on age (but not race) remained statistically significant.

## Pain characteristics

Respondents with recent pain were more likely than those without to endorse a lifetime history of chronic pain (63% vs. 14%,  $\chi^2 = 31.68$ ,  $df = 1$ ,  $p < .0001$ ). As summarized in Table 1, among those with at least moderate typical recent pain intensity, those with and those without a lifetime history of chronic pain did not differ on past 7-day typical pain interference; however, in comparison to the no history of chronic pain group, those with a lifetime history of chronic pain reported higher current pain intensity and pain frequency, and longer typical past 7-day pain duration. After controlling both age and race, in comparison to those without a lifetime history of chronic pain, those with a history of chronic pain endorsed higher current pain intensity,  $F(1, 137) = 6.33$ ,  $p < .05$ , pain frequency,  $F(1, 137) = 11.26$ ,  $p < .01$ , and pain duration,  $F(1, 137) = 10.84$ ,  $p < .01$ , and comparable pain interference,  $F(1, 137) = 3.76$ ,  $p = .05$ . These pain subgroup differences remained statistically significant after the application of a Bonferroni correction for multiple comparisons ( $.05 \div 4 = 0.013$ ).

Among participants reporting recent pain of at least moderate typical pain intensity, the most frequently endorsed pain locations were as follows: back (78%), legs (67%), stomach (36%), and head (28%). As summarized in Table 1, among respondents endorsing at least moderate typical recent pain intensity, pain location—except for pelvis and stomach—did not differ among those with and those without a lifetime history of chronic pain: In comparison to those without a history of chronic pain, those with a lifetime history of chronic pain were more likely to identify pelvis and less likely to identify stomach as the location of their most bothersome pain. These group differences did not remain statistically significant after the application of a Bonferroni correction for multiple comparisons ( $.05 \div 11 = 0.0045$ ).

As summarized in Table 1, among respondents reporting recent pain of at least moderate typical pain intensity, the most frequently endorsed cause of recent pain reported by those with and those without lifetime histories of chronic pain were accident and “don’t know,” respectively. In comparison to those without a history of chronic pain, those with a lifetime history of chronic pain were more likely to report accident, surgery, arthritis and nerve damage, and less likely to report “don’t know” as the genesis of their recent pain. Group differences on accident, surgery and “don’t know” (but not arthritis or nerve damage) remained statistically significant after the application of a Bonferroni correction for multiple comparisons ( $.05 \div 9 = 0.0055$ ). Opioid withdrawal was infrequently endorsed as a genesis of recent pain by either those with (3%) or those without (10%) a lifetime history of chronic pain.

## Substance-related pain reduction characteristics

As summarized in Table 1, among respondents reporting recent pain of at least moderate typical pain intensity, those with and those without a lifetime history of chronic pain did not differ on self-reported substances used in the past week to relieve pain. Comparably high proportions of those with and those without lifetime histories of chronic pain endorsed using heroin and non-medical prescription opiates (someone else’s and more than prescribed) to reduce pain.

## DISCUSSION

This study is among the first to examine the pain experiences of opioid dependent individuals seeking entry to MMT. Similar to studies on patients already enrolled in MMT, we found high rates of pain among opioid dependent individuals seeking entry into MMT. Of those endorsing recent pain (i.e., pain in the last week) of at least moderate typical intensity, two-thirds reported a lifetime history of chronic pain.

Among those reporting at least moderate typical recent pain intensity, we did not find any significant differences on substance-related pain reduction behaviors among those with and

those without a lifetime history of chronic pain; e.g., a similarly substantial proportion of each subgroup reported heroin use, non-medical use of prescription opiates (more than prescribed and consuming somebody else's), street methadone use, and other street drug use (e.g., cocaine, cannabis) for analgesic purposes. The comparably high proportion of both pain groups reporting "more than prescribed" opiate medication use suggests that they were currently or have recently been prescribed opiate analgesics. This finding suggests that clinicians should assess and address (non-medical) use of prescription opiate analgesics in patients with recent pain entering MMT, irrespective of their chronic pain status, and it also highlights the importance of providing pain in addition to providing addiction services in MMT.

Lifetime history of chronic pain status was not associated with increased use of other substances for pain relief, including non-medical use of non-opiate prescription medication (e.g., Celebrex, Celexa), non-medical use of benzodiazepine medication, and alcohol use. Non-medical use of benzodiazepines among those reporting recent pain may be an important target for MMT resource and program planning given the associated risk of overdose and sedation (14). Our findings suggest that MMT clinicians should consider assessing a wide array of substances that their patients with recent pain may be using for analgesic purposes. Patients with recent pain entering MMT might also benefit from psychoeducation regarding the potential health risks associated with continued unregulated use of substances for analgesic purposes while on methadone maintenance, especially if they are also being prescribed additional pharmacologic analgesic agents by MMT medical providers. It will be important to determine in future research the attributions of opioid dependent individuals with recent pain seeking MMT concerning the analgesic properties of different substances and the extent to which these substances are being used to manage pain and/or associated psychiatric distress.

Among participants endorsing at least moderate typical recent pain intensity, compared to those without a history of chronic pain, those with a lifetime history of chronic pain were older, reported higher pain frequency, and were more likely to endorse accident or surgery and less likely to endorse "don't know" as the genesis of their recent pain. Currently, it is unclear whether these differences have any prognostic significance; while previous research identified that age is a predictor of chronic severe pain in MMT (3) and while pain subsequent to surgery or an accident may connote chronicity, those with and those without a lifetime history of chronic pain in our study reported comparable levels of pain interference. The pain reported by our participants does not appear to be driven by opioid withdrawal, as this was infrequently endorsed by either pain subgroup as the cause of their recent pain. Furthermore, comparably low proportions of those with and those without a lifetime history of chronic pain reported pain secondary to HIV or cancer. Similar to recent research on patients with substance use disorders, back pain was endorsed as a pain location by the majority of study participants (7).

While among respondents reporting recent pain of at least moderate typical pain intensity, those with and those without a lifetime chronic pain history endorsed comparable substance-related pain reduction strategies, the former reported higher current pain intensity, pain frequency, and pain duration (after controlling for age and race). The extent to which these differences are associated with psychiatric distress is currently unknown and merits further research attention.

Several potential limitations are worth noting. Participants were seeking treatment at three opioid agonist treatment clinics run by the same organization in a particular geographic location; thus, our findings may or may not generalize to other MMT programs. Although the data was collected anonymously and participants were informed that their answers would not affect their treatment at APT, the questionnaire was completed at the treatment facility and this may have affected the responses of participants concerned about how staff might react to their reported behaviors. Since the study questionnaire was designed to be brief and not impose

undue burden on the intake admissions process, data regarding the psychiatric status and drug treatment history (including MMT) were not assessed.

The survey was cross-sectional and thus limits statements regarding causation between study variables. No independent assessments of participants' self-reported substance use (e.g., urinalysis) or pain status (e.g., abnormal physical or laboratory findings, diagnosis of painful diseases) were conducted. Given the absence of pain-related needs assessment instruments for MMT, we developed our own instrument which, although face-valid, has not been formally validated. Future research investigations might benefit from a more systematic examination of pain types (e.g., current chronic severe pain, recent pain but not meeting criteria for chronic severe pain) and a detailed assessment of the chronology of pain, substance use, and substance use disorder onsets. Given that the endorsement of multiple pain sites has been found to be associated with somatoform pain disorders and greater opiate use (15), the apparent tendency for study respondents to endorse multiple pain sites suggests that future research on patients entering MMT might benefit from systematic screening of somatoform pain disorders.

Although we limited the type of pain assessed in this study to physical pain (and omitted, for example, "emotional," "psychic" and other types of non-physical pain), the experience of recent physical pain and/or chronic physical pain among opioid dependent individuals seeking MMT may be associated with multiple conscious and unconscious thoughts (e.g., "I am being punished"), feelings (e.g., helplessness), and desires (e.g., instant relief from all pain), some of which may be specific to opioid addiction. These associated correlates were not examined in this study; further research in this area may benefit from their inclusion.

Despite these limitations, the current study represents an important investigation of the pain and substance-related pain reduction characteristics of opioid dependent individuals seeking MMT. The findings suggest that recent pain among those seeking MMT is common. Among those reporting at least moderate typical recent pain intensity, a variety of substances are being used to alleviate pain; endorsement of these substances did not vary as a function of a lifetime history of chronic pain. Finally, these findings may have implications for resource and program planning in MMT programs. Specifically, MMT programs might consider assessing recent and chronic pain, providing interventions to address substance-related pain reduction behaviors (e.g., psychoeducation), and offering pain management services. Given the apparent overlap between pain and opioid dependence among individuals seeking MMT, the optimal treatment approach for co-occurring chronic pain and opioid dependence in MMT may require an integrated perspective so that the possible connection between both medical conditions is adequately assessed and addressed

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**Table 1**  
Comparison of NHCP and LHCP Groups on Pain and Substance-related Pain Reduction Characteristics.<sup>1</sup>

|  | NHCP<br>(n = 71) | LHCP<br>(n = 142) | Statistical test       |
|--|------------------|-------------------|------------------------|
| Pain characteristics   |                  |                   |                        |
| Current pain intensity (mean intensity, ± SD)                    | 3.2 ± 0.8        | 3.4 ± 0.7         | $t = 2.18^*$           |
| Pain frequency <sup>2</sup> (mean frequency, ± SD)               | 3.2 ± 1.1        | 3.8 ± 0.9         | $t = 3.68^{***}$       |
| Typical pain duration <sup>2</sup> (mean duration, ± SD)         | 3.6 ± 0.9        | 3.9 ± 0.9         | $t = 2.28^*$           |
| Typical pain interference <sup>2</sup> (mean interference, ± SD) | 3.3 ± 1.0        | 3.6 ± 0.9         | $t = 1.42$             |
| Pain location  |                  |                   |                        |
| Back (% yes)   | 77.5             | 78.9              | $\chi^2 = 0.06$        |
| Shoulder (% yes)   | 25.4             | 25.4              | $\chi^2 = 0.02$        |
| Pelvis (% yes)   | 2.8              | 13.4              | $\chi^2 = 5.94^*$      |
| Hands (% yes)  | 12.7             | 20.4              | $\chi^2 = 1.94$        |
| Feet (% yes)   | 21.1             | 21.1              | $\chi^2 < 0.01$        |
| Stomach (% yes)  | 45.1             | 31.1              | $\chi^2 = 4.09^*$      |
| Head (% yes)   | 32.4             | 25.4              | $\chi^2 = 1.17$        |
| Face (% yes)   | 1.4              | 5.6               | $\chi^2 = 2.09$        |
| Legs (% yes)   | 69.0             | 66.2              | $\chi^2 = 0.17$        |
| Arms (% yes)   | 28.2             | 26.1              | $\chi^2 = 0.11$        |
| Other (% yes)  | 22.5             | 23.2              | $\chi^2 = 0.01$        |
| Pain genesis   |                  |                   |                        |
| Accident (% yes)   | 15.5             | 47.9              | $\chi^2 = 21.29^{***}$ |
| Surgery (% yes)  | 4.2              | 20.4              | $\chi^2 = 9.73^{**}$   |
| Nerve damage (% yes)   | 4.2              | 14.8              | $\chi^2 = 5.28^*$      |
| Arthritis (% yes)  | 7.0              | 19.0              | $\chi^2 = 5.31^*$      |
| HIV (% yes)  | 1.4              | 4.9               | $\chi^2 = 1.62$        |
| Cancer (% yes)   | 0.0              | 2.1               | $\chi^2 = 1.52$        |
| Opioid withdrawal (% yes)  | 2.8              | 9.8               | $\chi^2 = 3.42$        |
| Don't know (% yes)   | 38.0             | 14.1              | $\chi^2 = 15.78^{***}$ |
| Other (% yes)  | 25.0             | 24.0              | $\chi^2 < 0.01$        |
| Substance-related pain reduction characteristics                 |                  |                   |                        |
| More than prescribed opiate medication (% yes)                   | 36.6             | 40.1              | $\chi^2 = 0.25$        |
| Somebody else's opiate pain medication (% yes)                   | 32.4             | 40.1              | $\chi^2 = 1.21$        |
| Heroin (% yes)   | 47.9             | 50.7              | $\chi^2 = 0.15$        |
| Street methadone (% yes)   | 26.8             | 35.2              | $\chi^2 = 1.54$        |
| More than prescribed non-opiate medication (% yes)               | 4.2              | 10.6              | $\chi^2 = 2.46$        |
| Somebody else's non-opiate medication (% yes)                    | 2.8              | 9.9               | $\chi^2 = 3.38$        |
| More than prescribed benzodiazepine medication (% yes)           | 16.9             | 9.2               | $\chi^2 = 2.74$        |
| Somebody else's benzodiazepine medication (% yes)                | 12.7             | 7.0               | $\chi^2 = 1.85$        |
| Other street drugs (% yes)                                       | 35.2             | 31.0              | $\chi^2 = 0.39$        |
| Alcohol (% yes)  | 21.1             | 16.2              | $\chi^2 = 0.79$        |



Note: NHCP = No history of chronic pain, LHCP = Lifetime history of chronic pain

<sup>1</sup> Among individuals reporting recent pain with at least moderate typical pain intensity.

<sup>2</sup> In last 7 days.

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 $p < 0.05$

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 $p < 0.01$

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 $p < 0.001$