


RESEARCH

Open Access



# Inability to contact opioid agonist therapy prescribers during the COVID-19 pandemic in a Canadian setting: a cross-sectional analysis among people on opioid agonist therapy

Soroush Moallem<sup>1</sup>, Kora DeBeck<sup>1,2</sup>, Nadia Fairbairn<sup>1,3</sup>, Zishan Cui<sup>1,3</sup>, Rupinder Brar<sup>1,3,4</sup>, Dean Wilson<sup>1</sup>, Cheyenne Johnson<sup>1,5</sup>, M.-J. Milloy<sup>1,3</sup> and Kanna Hayashi<sup>1,6\*</sup> 

## Abstract

**Background:** The COVID-19 pandemic and consequent public health response may have undermined key responses to the protracted drug poisoning crisis, including reduced access to opioid agonist therapy (OAT) among people with opioid use disorder. Our study objectives were to estimate the prevalence of and identify factors associated with inability to contact OAT prescribers when in need among people on OAT in a Canadian setting during the dual public health crises.

**Methods:** Survey data were collected from three prospective cohort studies of community-recruited people who use drugs between July and November 2020, in Vancouver, Canada. A multivariable logistic regression analysis was used to identify potential factors associated with inability to contact OAT prescribers among patients who accessed OAT in the past 6 months.

**Results:** Among 448 respondents who reported accessing OAT in the past 6 months, including 231 (54.9%) men, 85 (19.0%) reported having been unable to contact OAT prescribers when needed, whereas 268 (59.8%) reported being able to talk to their prescriber when needed, and 95 (21.2%) reported that they did not want to talk to their medication prescriber in the previous 6 months. Among those who reported inability to contact prescribers, 45 (53.6%) reported that their overall ability to contact prescribers decreased since the start of the pandemic. In multivariable analyses, factors independently associated with inability to talk to OAT prescribers included: chronic pain (Adjusted Odds Ratio [AOR] = 1.82; 95% Confidence Interval [CI] 1.02, 3.27), moderate to severe symptoms of depression or anxiety (AOR = 4.74; 95% CI 2.30, 9.76), inability to access health/social services (AOR = 2.66; 95% CI 1.41, 5.02), and inability to self-isolate or socially distance most or all of the time (AOR = 2.13; 95% CI 1.10, 4.14).

**Conclusions:** Overall, approximately one fifth of the sample reported inability to contact their OAT prescribers when needed, and those people were more likely to have co-occurring vulnerabilities (i.e., co-morbidities, inability to access health/social services) and higher vulnerability to COVID-19. Interventions are needed to ensure optimal access to OAT and mitigate the deepening health inequities resulting from the COVID-19 pandemic and the escalating drug poisoning crisis.

\*Correspondence: [bccsu-kh@bccsu.ubc.ca](mailto:bccsu-kh@bccsu.ubc.ca)

<sup>1</sup> British Columbia Centre on Substance Use, St. Paul's Hospital, 400-1045 Howe Street, Vancouver, BC V6Z 2A9, Canada  
Full list of author information is available at the end of the article



© The Author(s) 2022. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

**Keywords:** COVID-19, Opioid agonist therapy, Medication for opioid use disorder, Overdose

## Background

People who use unregulated drugs (PWUD) are experiencing a deepening of health inequities resulting from the ongoing COVID-19 pandemic and the protracted drug poisoning crisis. Settings across Canada and the United States have documented unprecedented rates of fatal overdoses since the start of the pandemic [1–3], including a 58% increase in Canada and up to 60% increase in some jurisdictions in the US compared to the months prior to the pandemic [2]. Although the cause of the drug poisoning crisis is complex and multifactorial, the primary driver continues to be the contamination of the unregulated drug supply, most prominently with potent synthetic opioids such as fentanyl and its analogues [1, 3]. In addition, the unregulated drug supply has been increasingly contaminated in part owing to COVID-19 related border disruptions and drug shortages [4]. One of the primary interventions to address the poisoning crisis has been the expansion of opioid agonist therapy (OAT) to clinically manage opioid use disorder [5]. Indeed, a systematic review and meta-analysis has shown that retention in OAT is associated with significant reductions in risk of all-cause and overdose-related mortality [6]. However, OAT remains underutilized due to low retention rates [7–9], and access remains suboptimal due to a range of barriers, including: stigma and discrimination; onerous restrictions on treatment access including high out-of-pocket costs; daily witnessed ingestion at pharmacies or clinics; long wait times; and fragmented services (e.g., disconnected from primary care services) [10–15]. Qualitative interviews among providers of OAT in Canada have also noted that the biomedical focus of OAT and emphasis on abstinence hinders OAT treatment from being more patient-centred [11].

In an effort to minimize treatment disruptions and accommodate COVID-19 infection control mitigation strategies (i.e., physical distancing), jurisdictions across Canada and the US updated clinical practice guidelines for OAT (e.g., take-home doses, medication delivery) [16–18]. However, national qualitative studies in Canada during the first wave of the pandemic (May–July 2020), have reported that disruptions to OAT and other health and social services (e.g., harm reduction sites, access to inpatient treatment) were commonplace and largely attributed to public health infection control strategies such as closure of non-essential services, stay-at-home orders, and physical distancing [19, 20]. Of concern, PWUD have reported treatment gaps in

OAT that rendered individuals vulnerable to overdose, among other preventable negative physical and mental health outcomes [20]. Building on these previous qualitative studies, the purpose of this quantitative survey study was to assess access to OAT prescribers among OAT patients during the dual public health crisis of COVID-19 and drug poisoning, and amid British Columbia's provincial expansion of prescription guidelines. Specifically, our study objective was to identify factors associated with inability to contact OAT prescribers when in need among OAT patients derived from a community-recruited sample of PWUD in Vancouver, Canada, a setting where oral OAT (e.g., buprenorphine/naloxone and methadone) are widely available through primary care clinics and family physicians' offices and dispensed by community pharmacies.

## Methods

### Study sample

Data for this study were drawn from three ongoing prospective cohort studies of PWUD in Vancouver: the Vancouver Injection Drug Users Study (VIDUS), the AIDS Care Cohort to evaluate Exposure to Survival Services (ACCESS) and the At-Risk Youth Study (ARYS). These long-running (since 2005) and well-characterized community-recruited cohorts have been described elsewhere [21–23]. In brief, VIDUS enrolls HIV-seronegative adults ( $\geq 18$  years of age) who injected drugs in the month before enrolment. ACCESS enrolls HIV-seropositive adults who used an unregulated drug other than or in addition to cannabis in the month prior to enrolment. ARYS enrolls street-involved youth aged 14–26 who used an unregulated drug other than or in addition to cannabis in the month prior to enrolment. All cohorts recruit participants through street outreach and word-of-mouth. The studies use harmonized data collection and follow-up procedures to allow for merged data analyses. All three cohorts administer questionnaires by trained interviewers at equal follow-up frequency (i.e., every 6 months). At each study visit, participants receive a CAD \$40 honorarium. Between July and November 2020, due to the COVID-19 pandemic, all study follow-up interviews were conducted remotely over the phone. The present analysis drew data from these phone interviews and restricted an analytic sample to those who reported having accessed OAT in the past 6 months. All three cohorts have received ethics approval by University of British Columbia/Province Health Care Research Ethics Board.

### Study measures

The primary outcome of interest was self-reported ability to contact OAT prescriber when in need in the past 6 months, derived from a survey question: “In the last 6 months, was there a time when you wanted to talk to your medication prescriber but were not able?” Responses included: “unable to talk”, “able to talk”, “did not want to talk”. For regression analyses, our primary comparison was “unable to talk” vs. “able to talk”, while we also compared “did not want to talk” vs. “able to talk” as secondary analyses.

The explanatory variables of interest included the following socio-demographic variables: age (per year older, continuous); ethnicity/ancestry (white vs. IBPOC [Indigenous, Black, and People of Colour]); self-identified gender (male vs. female and non-binary gender); education (<secondary school vs.  $\geq$  secondary school); residence in the Downtown Eastside neighbourhood of Vancouver (DTES), an area with high concentration of unregulated drug use and related services (e.g., harm reduction and low-barrier OAT services); and homelessness. Drug use related variables included: injection drug use;  $\geq$  daily use of unregulated opioids (defined as fentanyl, “down” [the local term for unregulated opioids] or heroin [injection/non-injection] use);  $\geq$  daily non-medical use of prescription opioids;  $\geq$  daily use of stimulants, defined as powder/crack cocaine or crystal methamphetamine use;  $\geq$  daily use of cannabis; and non-fatal overdose. Other health-related variables included: anxiety/depression symptoms assessed using the Patient-Reported Outcomes Measurement Information System (PROMIS) short form (moderate/severe vs. mild/none) [24]; and chronic pain, defined as persistent or recurrent pain lasting longer than 3 months, a definition that is consistent with the International Association for the Study of Pain [25]. Other social/structural exposures of interest included: incarceration, police confrontations (defined as stopped, searched, or detained by the police), and experience of physical or sexual violence. We also included variables related to experiences that occurred since the start of the COVID-19 pandemic, including: increase in violence or sexual assault, increase in difficulty accessing health or social services (e.g., housing or counseling), and inability to self-isolate or social distance (all the time/most of the time vs. some of the time/not at all). Except for age, gender, education, and ethnicity/ancestry, all variables referred to the previous 6 months and coded as yes vs. no unless otherwise indicated.

### Statistical analysis

As a first step, we tested for differences in the descriptive characteristics of the sample across the three categories

in the outcome variable using the Pearson's  $\chi^2$  test and Fisher's test for counts <5 (for categorical variables) or Kruskal Wallis test (for continuous variables) as appropriate. Missing observations were minimal and excluded from the denominator for calculations involving percentages. Bivariable logistic regression was used to identify the crude relationships between factors associated with inability to contact OAT prescribers. The multivariable model was fit using an a priori-defined statistical protocol based on examining the AIC and type III p-values. First, a preliminary model was constructed using all variables significantly associated with the outcome in bivariable analyses at  $p < 0.10$ . Next, each variable with the highest p-value was removed sequentially, with the final model including the set of variables associated with the lowest AIC score. We also examined changes in the ability to contact OAT prescribers since the start of the COVID-19 pandemic stratified by our primary outcome variable using the following question: “Has your ability to talk to your medication prescriber changed since the beginning of the COVID public health emergency?” Responses included: “Yes, access/ability has increased”, “Yes, access/ability has decreased”, “No”.

We also conducted two exploratory analyses to aid the interpretation of the results of the primary analyses. In order to help clarify whether the inability to contact OAT prescribers resulted from prescriber- or patient-related factors, we conducted an exploratory analysis to compare participants' reports of whether any clinic visits or service for OAT were cancelled due to the COVID-19 pandemic in the past month across the three categories of our primary outcome variable. Lastly, in the second exploratory analysis, among those who received methadone as their most recent OAT medication ( $n = 316$ ), we examined perceived levels of the medication dosage (about right, too low, or too high) stratified by our primary outcome variable. All p-values were two-sided and all statistical analyses were conducted using SAS version 9.4 (SAS Institute, Cary, North Carolina, United States).

### Results

In total, 884 participants completed an interview between July and November 2020, of whom 448 (50.7%) participants reported being on OAT in the past 6 months and thus formed the analytic sample. The analytic sample was comprised of 246 (54.9%) self-identified males, 273 (61.4%) self-identified as white, 158 (35.5%) self-identified as Indigenous and 14 (3.1%) self-identified as POC. The sample was further comprised of 227 VIDUS (50.7%), 140 (31.3%), ACCESS and 81 (18.1%) ARYS participants and the median age was 49 (1st and 3rd quartile: 37, 57) years. Overall, 235 (52.0%) resided in the DTES neighbourhood in the past 6 months, 151 (33.4%) in

other neighbourhoods within the city of Vancouver, and 66 (14.6%) outside of the city of Vancouver.

As shown in Table 1, participants reported accessing a range of OAT, with Methadone (70.5%) being the most prescribed medication. Overall, 85 (19.0%) reported inability to talk to their medication prescriber when needed in the past 6 months when needed, whereas 268 (59.8%) reported being able to talk to their medication prescriber when needed, and 95 (21.2%) reported that they did not want to talk to their medication prescriber in the past 6 months. In addition, 61 (13.8%) reported that their ability to contact their medication prescriber had decreased since the start of the COVID-19 pandemic.

In the first multivariable model (Table 2), factors significantly associated with inability to talk to medication prescribers when needed (compared to ability to talk) included: younger age (Adjusted Odds Ratio [AOR]; 0.94; 95% Confidence Interval [CI] 0.91–0.97), white ethnicity/ancestry (AOR: 3.35; 95% CI 1.72–6.51), chronic pain (AOR=1.82; 95% CI 1.02–3.27); moderate/severe symptoms of depression or anxiety (AOR=4.66; 95% CI 2.27–9.57); inability to self-isolate or socially distance all or most of the time (AOR: 2.13; 95% CI 1.10–4.14); and increased inability to access health/social services during the COVID-19 pandemic (AOR: 2.66; 95% CI 1.41–5.02). In the second multivariable model (Table 2), only inability to self-isolate or socially distance all or most of the time (OR: 2.21; 95% CI 1.24–3.94) was retained in the model selection procedure and was positively associated with not wanting to talk to prescribers (compared to ability to talk).

In the sub-analysis, among those who reported inability to talk to prescribers, the majority (53.6%,  $n=45$ ) reported that their access to prescribers had decreased since the start of the pandemic, while the majority of those who reported ability to talk to prescribers (91.6%,  $n=240$ ) and the majority of those who did not want to talk to prescribers (92.6%,  $n=88$ ) reported that their access to prescribers had remained unchanged since the start of the pandemic (Fig. 1). Further, in the exploratory analysis, as shown in Table 1, 20% of those who reported inability to contact prescribers reported that their OAT clinic visits or service were cancelled due to the COVID-19 pandemic in the past month, while 5.6% and 11.6% of those who reported ability to contact their prescribers and who did not want to talk to prescribers, respectively did so ( $p<0.001$ ). Among a sub-sample of those who received methadone ( $n=316$ ), 32.7% those who reported inability to contact prescribers perceived their methadone doses as too low, whereas 16.3% and 23.5% of those who were able to talk and who did not want to talk to prescribers, respectively did so ( $p=0.004$ ).

## Discussion

Between July and November 2020, approximately one in five people on OAT in our community-recruited sample of PWUD reported inability to contact their OAT providers when needed in the past 6 months. Our multivariable findings showed that those who were unable to talk to their OAT prescribers were more likely to have co-morbidities (such as chronic pain and mental health issues), perceived greater health/social services disruptions since the onset of the COVID-19 pandemic, and were unable to ensure COVID-19 precautions. In addition, about half (53%) of those who reported inability to contact their prescriber perceived that their overall access to providers had decreased since the start of the pandemic.

The findings that about a fifth of our sample reported difficulty contacting their prescriber when needed and that over half of these individuals perceived their overall access to prescribers as reduced since the onset of the pandemic is concerning. Because our study did not examine specific reasons for the inability to contact prescribers, we are unable to disentangle provider/clinic- (e.g., service cancellations) and patient-related factors (e.g., social-structural factors shaping their living environment) related to the inability. Both these types of factors likely co-existed, and in some cases, they were intertwined during the COVID-19 pandemic. Our exploratory analysis shows that those who were unable to contact their prescribers when needed were disproportionately affected by cancellation of OAT clinic visits or service in the past month compared to those who were able to talk or did not want to talk to prescribers (20% vs. 5.6% vs. 11.6%, respectively;  $p<0.001$ ). This result indicates that provider-level factors played a role in some participant's inability to contact prescribers but not all. An inability to contact prescribers when needed could indicate or result in suboptimal treatment experience, which, if left unaddressed, could be a precursor to disengagement with OAT services and lead to more use of unregulated and contaminated drugs. For example, our exploratory results focusing on those receiving methadone demonstrated that one aspect of suboptimal treatment experience, that is perceiving that medication dosage is insufficient, was the highest among those who were unable to contact their methadone prescribers (32.7%) compared to those who were able (16.3%) or did not want to talk to their prescribers (23.5%;  $p=0.004$ ). Given that lower methadone dosages have been shown to be a strong predictor of treatment discontinuation [26–30], and also because the concentration of fentanyl in the unregulated supply has increased during the COVID-19 pandemic [3], it is particularly important to address any patient-provider communication gaps and the insufficient medication dosages

**Table 1** Sample characteristics stratified by inability to contact opioid agonist treatment (OAT) prescriber when needed among 448 people who accessed OAT in the past 6 months in Vancouver, Canada, between July and November 2020

| Characteristic  | Total      | Inability to contact OAT prescriber (%) |              |                      | p-value |
|---|------------|---|--------------|----------------------|---------|
|   |            | Unable to Talk                          | Able to talk | Did not want to talk |         |
|   | 448 (100%) | 85 (19.0%)                              | 268 (59.8%)  | 95 (21.2%)           |         |
| Most recent OAT prescribed  |            |   |              |                      |         |
| Methadone   | 316 (70.5) | 59 (69.4)                               | 184 (68.7)   | 73 (76.8)            | –       |
| Buprenorphine/naloxone (suboxone)   | 34 (7.6)   | 8 (9.4)                                 | 23 (8.6)     | 3 (3.16)             | –       |
| Long-acting buprenorphine   | 1 (0.2)    | 0                                       | 1 (0.4)      | 0                    | –       |
| Injectable OAT  | 29 (6.5)   | 3 (3.5)                                 | 20 (7.5)     | 6 (6.3)              | –       |
| SROM  | 37 (8.3)   | 6 (7.1)                                 | 28 (10.5)    | 3 (3.1)              | –       |
| Cancellation of visits or service for OAT due to the COVID-19 pandemic <sup>a</sup> | 43 (9.6)   | 17 (20.0)                               | 15 (5.6)     | 11 (11.6)            | <0.001  |
| Age (median, Q1–Q3)   | 49 (37–57) | 40 (31–53)                              | 50 (39–58)   | 49 (37–57)           | 0.001   |
| Male (vs. female and non-binary)  | 246 (54.9) | 45 (52.9)                               | 139 (51.9)   | 62 (65.3)            | 0.073   |
| White (vs. IBPOC)   | 273 (61.4) | 65 (76.5)                               | 157 (59.0)   | 51 (54.3)            | 0.008   |
| ≥Secondary school   | 209 (47.4) | 39 (46.4)                               | 130 (49.1)   | 40 (43.5)            | 0.685   |
| Chronic pain <sup>b,c</sup>   | 194 (43.3) | 48 (56.5)                               | 113 (42.3)   | 33 (34.7)            | 0.011   |
| Moderate/severe depression or anxiety <sup>d</sup>                                  | 220 (52.6) | 62 (81.6)                               | 116 (46.0)   | 42 (46.7)            | <0.000  |
| DTES residence <sup>b</sup>   | 235 (52.5) | 41 (48.2)                               | 145 (54.1)   | 49 (51.6)            | 0.629   |
| Homeless <sup>b</sup>   | 55 (12.3)  | 13 (15.5)                               | 29 (10.9)    | 13 (13.7)            | 0.481   |
| Incarceration <sup>b</sup>  | 10 (2.2)   | 2 (2.4)                                 | 5 (1.9)      | 3 (3.2)              | 0.765   |
| Negative police encounter <sup>b,e</sup>  | 17 (3.8)   | 5 (6.0)                                 | 8 (3.0)      | 4 (4.2)              | 0.459   |
| Non-fatal overdose <sup>b</sup>   | 68 (15.3)  | 20 (24.1)                               | 31 (11.6)    | 17 (17.9)            | 0.016   |
| Self-reported substance use <sup>b</sup>  |            |   |              |                      |         |
| Daily unregulated opioids use <sup>f</sup>  | 203 (45.4) | 44 (51.8)                               | 113 (42.3)   | 46 (48.4)            | 0.252   |
| Daily prescription opioids use <sup>g</sup>   | 13 (2.9)   | 4 (4.7)                                 | 4 (1.5)      | 5 (5.3)              | 0.096   |
| Daily stimulant use   | 150 (33.6) | 35 (41.2)                               | 81 (30.3)    | 34 (35.8)            | 0.160   |
| Injection drug use  | 264 (58.9) | 54 (63.5)                               | 152 (56.7)   | 58 (61.1)            | 0.481   |
| Experiences since beginning of COVID-19   |            |   |              |                      |         |
| Increase in violence  | 35 (8.1)   | 12 (14.5)                               | 19 (7.4)     | 4 (4.4)              | 0.043   |
| Increase in difficulty accessing health/social services                             | 88 (20.3)  | 38 (45.8)                               | 39 (15.2)    | 11 (11.8)            | <0.000  |
| Inability to self-isolate or social distance  | 106 (23.8) | 29 (34.5)                               | 46 (17.2)    | 31 (32.6)            | <0.000  |
| Perceived levels of medication doses among those on methadone (n = 316)             |            |   |              |                      |         |
| About right   | 218 (73.9) | 32 (58.2)                               | 140 (81.4)   | 46 (67.6)            | 0.004   |
| Too low   | 62 (21.0)  | 18 (32.7)                               | 28 (16.3)    | 16 (23.5)            |         |
| Too high  | 15 (5.1)   | 5 (9.1)                                 | 4 (2.3)      | 6 (8.8)              |         |

Missing observations were minimal and excluded from the denominator when calculating percentages

DTES downtown eastside, PO prescription opioid, SROM slow-release oral morphine, IBPOC indigenous, black, and people of colour

<sup>a</sup> Denotes behaviors/events in the past month

<sup>b</sup> Denotes behaviors/events in the past 6 months

<sup>c</sup> Chronic Pain is defined using the international pain guidelines (persistent or recurrent pain lasting longer than 3 months)

<sup>d</sup> Patient-Reported Outcomes Measurement Information System (PROMIS) short form was used to assess anxiety/depression (moderate/severe vs. mild/none)

<sup>e</sup> Negative police encounter refers to being stopped, searched, or detained by the police

<sup>f</sup> Daily unregulated opioid use includes the use of fentanyl, down unspecified or heroin (injection/non-injection)

<sup>g</sup> Daily stimulant use included the use of daily crack, daily methamphetamine, and daily cocaine in the last 6 months

perceived by patients to help reduce patients' exposure to unregulated opioids with high concentrations of fentanyl.

Our multivariable analysis found that the perceived communication challenge with OAT prescribers were

concentrated among people who reported co-morbidities including chronic pain and moderate/severe depression or anxiety. Of concern, chronic pain and mental health issues are persistent unmet healthcare needs among

**Table 2** Univariable and multivariable logistic regression analyses of factors associated with ability to contact Opioid Agonist Treatment (OAT) prescriber when needed among 448 people who accessed OAT in the past 6 months in Vancouver, Canada, between July 2020 and November 2020

| Variable  | Model 1                         |                   | Model 2                               |                   |
|---|---------------------------------|-------------------|---------------------------------------|-------------------|
|   | Unable to talk vs. Able to talk |                   | Did not want to talk vs. Able to talk |                   |
|   | OR (95% CI)                     | AOR (95% CI)      | OR (95% CI)                           | AOR (95% CI)      |
| Age (per year increase)                                 | 0.96 (0.94, 0.98)               | 0.94 (0.91, 0.97) | 0.99 (0.97, 1.01)                     | –                 |
| Male (vs. female and non-binary)                        | 1.05 (0.63, 1.74)               | –                 | 1.74 (1.07, 2.83)                     | –                 |
| White (vs. IBPOC)                                       | 2.26 (1.29, 3.94)               | 3.35 (1.72, 6.51) | 0.82 (0.51, 1.32)                     | –                 |
| ≥ Secondary school                                      | 0.90 (0.55, 1.47)               | –                 | 0.80 (0.50, 1.29)                     | –                 |
| Chronic pain <sup>a,b</sup>                             | 1.77 (1.08, 2.89)               | 1.82 (1.02, 3.27) | 1.77 (1.08, 2.89)                     | –                 |
| Moderate/severe depression or anxiety <sup>c</sup>      | 5.19 (2.76, 9.76)               | 4.66 (2.27, 9.57) | 5.19 (2.76, 9.76)                     | –                 |
| DTEs residence <sup>a</sup>                             | 0.79 (0.48, 1.29)               | –                 | 0.79 (0.48, 1.29)                     | –                 |
| Homeless <sup>a</sup>                                   | 1.50 (0.74, 3.04)               | –                 | 1.50 (0.74, 3.04)                     | –                 |
| Incarceration <sup>a</sup>                              | 1.28 (0.24, 6.71)               | –                 | 1.28 (0.24, 6.71)                     | –                 |
| Negative police encounter <sup>a,d</sup>                | 2.04 (0.65, 6.42)               | –                 | 2.04 (0.65, 6.42)                     | –                 |
| Non-fatal overdose <sup>a</sup>                         | 2.42 (1.29, 4.52)               | –                 | 2.42 (1.29, 4.52)                     | –                 |
| Self-reported substance use <sup>a</sup>                |                                 |                   |                                       |                   |
| Daily unregulated opioids use <sup>e</sup>              | 1.46 (0.90, 2.39)               | –                 | 1.46 (0.90, 2.39)                     | –                 |
| Daily PO use  | 3.23 (0.79, 13.22)              | –                 | 3.23 (0.79, 13.22)                    | –                 |
| Daily stimulants use <sup>f</sup>                       | 1.61 (0.97, 2.66)               | –                 | 1.61 (0.97, 2.66)                     | –                 |
| Injection drug use <sup>g</sup>                         | 1.33 (0.80, 2.20)               | –                 | 1.33 (0.80, 2.20)                     | –                 |
| Experiences since beginning COVID-19                    |                                 |                   |                                       |                   |
| Increase in violence                                    | 2.11 (0.98, 4.55)               | –                 | 2.11 (0.98, 4.55)                     | –                 |
| Increase in difficulty accessing health/social services | 4.72 (2.72, 8.18)               | 2.66 (1.41, 5.02) | 4.72 (2.72, 8.18)                     | –                 |
| Inability to self-isolate or social distance            | 2.53 (1.46, 4.39)               | 2.13 (1.10, 4.14) | 2.53 (1.46, 4.39)                     | 2.21 (1.24, 3.94) |

AOR adjusted odds ratio, CI confidence interval, IBPOC indigenous, black, and people of colour, DTEs downtown eastside, OAT opioid agonist treatment, OR odds ratio, PO prescription opioid

<sup>a</sup> Denotes behaviors/events in the past 6 months

<sup>b</sup> Chronic Pain is defined using the international pain guidelines (persistent or recurrent pain lasting longer than 3 months)

<sup>c</sup> Patient-Reported Outcomes Measurement Information System (PROMIS) short form was used to assess anxiety/depression (moderate/severe vs. mild/none)

<sup>d</sup> Negative police encounter refers to being stopped, searched, or detained by the police

<sup>e</sup> Daily unregulated opioid use includes the use of fentanyl, down unspecified or heroin (injection/non-injection)

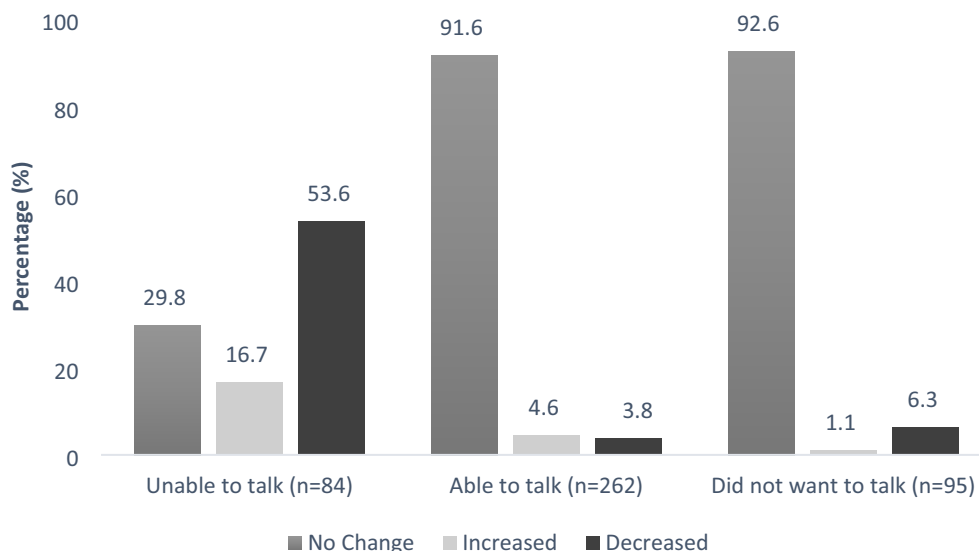
<sup>f</sup> Daily stimulant use included the use of daily crack, daily *methamphetamine*, and daily cocaine in the last 6 months

<sup>g</sup> Injection Drug Use includes those who injected drugs at least once in the last 6 months

PWUD [12, 15, 31–33], and consistently linked to higher levels of self-medication, greater drug use severity, and engagement with the unregulated and contaminated drug supply. Research has also linked greater pain severity and untreated psychological disorders with discontinuation of OAT or inability to access treatment [32, 34]. Our findings strengthen the need for improved management of both mental health and chronic pain issues among those on OAT. To this end, many jurisdictions have yet to integrate OAT services into primary care and mental health services, which remains a persistent structural barrier for providers to provide and patients to receive comprehensive and optimal treatment for co-occurring health issues, particularly chronic pain and mental health among PWUD [12, 15].

Our findings also showed that those who reported an increased difficulty in accessing health/social services in general (e.g., counselling or housing) and those who were unable to self-isolate or social distance all or most of the time were more likely to report inability to contact OAT providers. These findings indicate that those who experienced difficulty contacting their OAT prescribers may also be at increased risk of not only overdose (due to sub-optimal OAT) but also COVID-19 infection (due to being unable to self-isolate or social distance) and other negative health outcomes (due to difficulty accessing health/social services in general).

Overall, the findings in this study underscore the need to mitigate treatment gaps and subsequent overdose risk as a potential result of suboptimal treatment



**Fig. 1** Changes in the ability to talk to medication prescriber since the beginning of COVID-19 pandemic amongst respondents who were unable to talk, able to talk, and did not want to talk to their medication prescriber (n=441)

experience. Inability to contact OAT prescribers when needed undermines the intended goal of the expanded OAT prescription guidelines in this setting and interventions are needed to improve communication between OAT patients and prescribers. Research suggests that multi-level interventions are needed to remedy the existing barriers to accessing OAT [10–15], as well as new challenges posed by the pandemic [19, 20], which should include but not limited to: routine risk assessment of OAT provisions, access to telemedicine (including provisions of technology) [11], and expansion of mobile OAT options. It is worth noting that our primary outcome measure, inability to contact OAT prescribers, is not an objective measure of service access (e.g., whether they accessed OAT or not) but is assessing one aspect of patient-reported satisfaction with OAT in relation to patient-provider communication. Broadly speaking, a key goal of all national health systems according to the World Health Organization is to respond to the legitimate expectations of individuals (otherwise known as health system responsiveness), which includes prompt attention to individual care needs [35, 36]. In this regard, patient-reported (in)ability to communicate with OAT prescribers when needed can be conceptualized as an important element shaping the individual's treatment experiences and health system responsiveness. Overall, the findings in this study underscore the need to address patient-provider communication gap and improve suboptimal treatment experiences, which could lead to negative health outcomes.

Our findings should be considered with several limitations. First, the non-random nature of our sample reduces the ability to generalize our results to all PWUD in our study setting. Study data were also derived from telephone-based interviews, which may have underestimated the level of inability to contact providers, as those without a known telephone number could not be reached and may be at greater risk for having inability to access providers. In addition, all data were self-reported, and therefore might be influenced by reporting bias. We are also unable to discern potential reasons for why some participants reported an inability to talk to prescribers and not wanting to talk to prescribers. We are also unable to discern potential reasons for why some participants reported not wanting to talk to prescribers, an important area for future research as it could be an indicator of sub-optimal treatment. Additionally, there were shifts towards virtual and remote delivery of services that accompanied the COVID-19 pandemic in our setting, which we are unable to account for in our findings. If participants did access telemedicine services, we would expect a potential improved ability to contact service providers when needed, however future research is needed to account for the impact of telemedicine and its utility in improving communication between patients and providers. Lastly, our analytic sample was restricted to those who reported having accessed OAT in the past 6 months, which may have included experiences that occurred prior to COVID-19 for those with interview dates in July/August 2020 (n = 117).

## Conclusion

Our findings show that among OAT patients derived from a community-recruited sample of PWUD in Vancouver, Canada, patient's ability to contact OAT prescribers was negatively impacted during the first 6 months of the COVID-19 pandemic. Overall, one in five OAT patients reported inability to contact prescribers when needed in the past 6 months, of which over half reported that their ability to reach their prescribers had decreased since the start of the pandemic. Individuals who reported inability to talk to prescribers were characterized by co-occurring vulnerabilities, including health issues (e.g., chronic pain, mental health), greater perceived barriers to accessing health/social services during the pandemic, and inability to self-isolate or social distance all or most of the time. Expanded efforts are needed to address the patient-provider communication gap and the resultant suboptimal treatment experiences.

## Acknowledgements

The VIDUS, ARYS and ACCESS studies take place on the unceded territory of the Coast Salish Peoples, including the territories of the xwməkwəyəm (Musqueam), Skwxwú7mesh (Squamish), Stó:lō and Səlilwətaʔ/Selilwitulh (Tsleil-Waututh) Nations. We thank current and past participants, staff and investigators of all cohorts included in this study for their contributions. We also thank Neetika Saini for her contribution to the early stages of this study.

## Author contributions

SM and KH designed the study. SM wrote the original draft. ZC performed the statistical analysis. KH, MJM, and KD performed funding acquisition. All authors analyzed the data and performed review and editing of the original draft. All authors read and approved the final manuscript.

## Funding

The study was supported by the US National Institutes of Health (NIH; U01DA038886, U01DA021525), the Canadian Institute of Health Research (CIHR; MS1-173065) and the Michael Smith Foundation for Health Research (MSFHR; 19032). KH holds the St. Paul's Hospital Chair in Substance Use Research and is supported in part by the NIH (U01DA038886), a MSFHR Scholar Award, and the St. Paul's Foundation. MJM is supported by the NIH (U01DA0251525). KD is supported by a MSFHR/St. Paul's Hospital Foundation-Providence Health Care Career Scholar Award and a CIHR New Investigator Award. NF is supported by a Philip Owen Professorship in Addiction Medicine at the University of British Columbia, and a Scholar Award from the Michael Smith Foundation for Health Research/St. Paul's Hospital Foundation.

## Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request and with permission of the University of British Columbia/Providence Health Care Research Ethics Board.

## Declarations

### Ethics approval and consent to participate

All three cohorts have received ethics approval by University of British Columbia/Providence Health Care Research Ethics Board. All participants provided written informed consent prior to enrolment in the study.

### Consent for publication

Not applicable.

### Competing interests

MJM's institution has received an unstructured gift from NG Biomed, Ltd., to support his research. MJM is the Canopy Growth professor of cannabis science

at the University of British Columbia, a position created by unstructured gifts to the university from Canopy Growth, a licensed producer of cannabis, and the Government of British Columbia's Ministry of Mental Health and Addictions. The funder that supports MJM did not have any role in study design; collection, analysis, and interpretation of data; writing the report; and the decision to submit the report for publication. All authors declare no conflict of interest.

## Author details

<sup>1</sup>British Columbia Centre on Substance Use, St. Paul's Hospital, 400-1045 Howe Street, Vancouver, BC V6Z 2A9, Canada. <sup>2</sup>School of Public Policy, Simon Fraser University, Burnaby, BC, Canada. <sup>3</sup>Department of Medicine, University of British Columbia, Vancouver, BC, Canada. <sup>4</sup>Vancouver Coastal Health Authority, Vancouver, BC, Canada. <sup>5</sup>School of Nursing, University of British Columbia, Vancouver, BC, Canada. <sup>6</sup>Faculty of Health Sciences, Simon Fraser University, Burnaby, BC, Canada.

Received: 21 June 2022 Accepted: 2 December 2022

Published online: 15 December 2022

## References

- Centers for Disease Control and Prevention. Overdose deaths accelerating during COVID-19. 2020. <https://www.cdc.gov/media/releases/2020/p1218-overdose-deaths-covid-19.html>. Accessed 23 Mar 2022.
- Imtiaz S, Nafeh F, Russell C, Ali F, Elton-Marshall T, Rehm J. The impact of the novel coronavirus disease (COVID-19) pandemic on drug overdose-related deaths in the United States and Canada: a systematic review of observational studies and analysis of public health surveillance data. *Subst Abuse Treat Prev Policy*. 2021;16(1):87.
- BC Coroners Service. Illicit drug toxicity deaths in BC. 2022.
- United Nations Office on Drugs and Crime. COVID-19 and the drug supply chain: from production and trafficking to use. 2020.
- Centre for Addiction and Mental Health. Opioid agonist therapy: a synthesis of Canadian guidelines for treating opioid use disorder. 2021.
- Sordo L, Barrio G, Bravo MJ, Indave BI, Degenhardt L, Wiessing L, et al. Mortality risk during and after opioid substitution treatment: systematic review and meta-analysis of cohort studies. *BMJ*. 2017;357:j1550–j1550.
- Nosyk B, Marsh DC, Sun H, Schechter MT, Anis AH. Trends in methadone maintenance treatment participation, retention, and compliance to dosing guidelines in British Columbia, Canada: 1996–2006. *J Subst Abuse Treat*. 2010;39(1):22–31.
- Klimas J, Hamilton MA, Gorfinkel L, Adam A, Cullen W, Wood E. Retention in opioid agonist treatment: a rapid review and meta-analysis comparing observational studies and randomized controlled trials. *Syst Rev*. 2021;10(1):216.
- Mattick RP, Breen C, Kimber J, Davoli M. Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. *Cochrane Database Syst Rev*. 2014. <https://doi.org/10.1002/14651858.CD002207.pub4>.
- Mackey K, Veazie S, Anderson J, Bourne D, Peterson K. Barriers and facilitators to the use of medications for opioid use disorder: a rapid review. *J Gen Intern Med*. 2020;35(3):954–63.
- Maina G, Tahir H, Docabo A, Kahia N, Brunelle C. Exploring health-care providers' experiences in the care of clients on opioid agonist treatment in two western Canadian clinics. *Can J Nurs Res*. 2019;52(1):15–24.
- Vurthy VH. Facing addiction in the United States: the surgeon general's report of alcohol, drugs, and health. *JAMA*. 2017;317(2):133–4.
- Jones CM, Campopiano M, Baldwin G, McCance-Katz E. National and state treatment need and capacity for opioid agonist medication-assisted treatment. *Am J Public Health*. 2015;105(8):e55–63.
- Sharma A, Kelly SM, Mitchell SG, Gryczynski J, O'Grady KE, Schwartz RP. Update on barriers to pharmacotherapy for opioid use disorders. *Curr Psychiatry Rep*. 2017;19(6):35.
- Chatterjee A, Yu EJ, Tishberg L. Exploring opioid use disorder, its impact, and treatment among individuals experiencing homelessness as part of a family. *Drug Alcohol Depend*. 2018;188:161–8.
- Andraka-Christou B, Bouskill K, Haffajee RL, Randall-Kosich O, Golan M, Totaram R, et al. Common themes in early state policy responses to



- substance use disorder treatment during COVID-19. *Am J Drug Alcohol Abuse*. 2021;47(4):486–96.
17. British Columbia Centre on Substance Use, BC Ministry of Health, Ministry of Mental Health and Addictions. Risk mitigation in the context of dual health emergencies—interim clinical guidance: update. 2022.
  18. Centre for Addiction and Mental Health. COVID-19 opioid agonist treatment guidance. 2021.
  19. Ali F, Russell C, Nafeh F, Rehm J, LeBlanc S, Elton-Marshall T. Changes in substance supply and use characteristics among people who use drugs (PWUD) during the COVID-19 global pandemic: a national qualitative assessment in Canada. *Int J Drug Policy*. 2021;93: 103237.
  20. Russell C, Ali F, Nafeh F, Rehm J, LeBlanc S, Elton-Marshall T. Identifying the impacts of the COVID-19 pandemic on service access for people who use drugs (PWUD): a national qualitative study. *J Subst Abuse Treat*. 2021;129: 108374.
  21. Wood E, Kerr T, Marshall B, Li K, Zhang R, Hogg R, et al. Longitudinal community plasma HIV-1 RNA concentrations and incidence of HIV-1 among injecting drug users: prospective cohort study. *BMJ*. 2009. <https://doi.org/10.1136/bmj.b1649>.
  22. Hayashi K, Milloy MJ, Lysyshyn M, DeBeck K, Nosova E, Wood E, et al. Substance use patterns associated with recent exposure to fentanyl among people who inject drugs in Vancouver, Canada: a cross-sectional urine toxicology screening study. *Drug Alcohol Depend*. 2018;183:1–6.
  23. Wood E, Kerr T, Lloyd-Smith E, Buchner C, Marsh DC, Montaner JSG, et al. Methodology for evaluating Insite: Canada's first medically supervised safer injection facility for injection drug users. *Harm Reduct J*. 2004;1(1):9.
  24. Broderick JE, DeWitt EM, Rothrock N, Crane PK, Forrest CB. Advances in patient-reported outcomes: the NIH PROMIS<sup>®</sup> measures. *EGEMS*. 2013;1(1):12.
  25. Merskey H. Classification of chronic pain: Descriptions of chronic pain syndromes and definitions of pain terms. *Pain*. 1986;Suppl 3:226.
  26. Nosyk B, MacNab YC, Sun H, Fischer B, Marsh DC, Schechter MT, et al. Proportional hazards frailty models for recurrent methadone maintenance treatment. *Am J Epidemiol*. 2009;170(6):783–92.
  27. Wickersham JA, Zahari MM, Azar MM, Kamarulzaman A, Altice FL. Methadone dose at the time of release from prison significantly influences retention in treatment: Implications from a pilot study of HIV-infected prisoners transitioning to the community in Malaysia. *Drug Alcohol Depend*. 2013;132(1):378–82.
  28. Peles E, Schreiber S, Sason A, Adelson M. Similarities and changes between 15- and 24-year survival and retention rates of patients in a large medical-affiliated methadone maintenance treatment (MMT) center. *Drug Alcohol Depend*. 2018;185:112–9.
  29. Lo A, Kerr T, Hayashi K, Milloy MJ, Nosova E, Liu Y, et al. Factors associated with methadone maintenance therapy discontinuation among people who inject drugs. *J Subst Abuse Treat*. 2018;94:41–6.
  30. Lake S, Buxton J, Walsh Z, Cooper ZD, Socias ME, Fairbairn N, et al. Methadone dose, cannabis use, and treatment retention: findings from a community-based sample of people who use unregulated drugs. *J Addict Med*. 9900. [https://journals.lww.com/journaladdictionmedicine/Fulltext/9900/Methadone\\_Dose,\\_Cannabis\\_Use,\\_and\\_Treatment.32.aspx](https://journals.lww.com/journaladdictionmedicine/Fulltext/9900/Methadone_Dose,_Cannabis_Use,_and_Treatment.32.aspx).
  31. Moallef S, Homayra F, Milloy MJ, Bird L, Nosyk B, Hayashi K. High prevalence of unmet healthcare need among people who use illicit drugs in a Canadian setting with publicly-funded interdisciplinary primary care clinics. *Subst Abus*. 2020. <https://doi.org/10.1080/08897077.2020.1846667>.
  32. Voon P, Wang L, Nosova E, Hayashi K, Milloy MJ, Wood E, et al. Greater pain severity is associated with inability to access addiction treatment among a cohort of people who use drugs. *J Pain Res*. 2020;13:2443–9.
  33. Hyshka E, Anderson JT, Wild TC. Perceived unmet need and barriers to care amongst street-involved people who use illicit drugs. *Drug Alcohol Rev*. 2017;36(3):295–304.
  34. Gros DF, Milanak ME, Brady KT, Back SE. Frequency and severity of comorbid mood and anxiety disorders in prescription opioid dependence. *Am J Addict*. 2013;22(3):261–5.
  35. Mirzoev T, Kane S. What is health systems responsiveness? Review of existing knowledge and proposed conceptual framework. *BMJ Glob Health*. 2017;2(4): e000486.
  36. Valentine N, de Silva A, Kawabata K, Darby C, Murray C, Evans D. Health system responsiveness: concepts, domains and operationalization. *Health*

system performance, debates, methods and empiricism. Geneva: World Health Organization; 2003.

## Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

**Ready to submit your research? Choose BMC and benefit from:**

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

**At BMC, research is always in progress.**

Learn more [biomedcentral.com/submissions](https://biomedcentral.com/submissions)



© 2022. This work is licensed under <http://creativecommons.org/licenses/by/4.0/> (the “License”). Notwithstanding the ProQuest Terms and Conditions, you may use this content in accordance with the terms of the License.