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Evaluation of an emergency safe supply drugs and managed alcohol program in COVID-19 isolation hotel shelters for people experiencing homelessness

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ABSTRACT

Background: During a COVID-19 outbreak in the congregate shelter system in Halifax, Nova Scotia, Canada, a healthcare team provided an emergency "safe supply" of medications and alcohol to facilitate isolation in COVID-19 hotel shelters for residents who use drugs and/or alcohol. We aimed to evaluate (a) substances and dosages provided, and (b) outcomes of the program.

Methods: We reviewed medical records of all COVID-19 isolation hotel shelter residents during May 2021. The primary outcome was successful completion of 14 days isolation, as directed by public health orders. Adverse events included (a) overdose; (b) intoxication; and (c) diversion, selling, or sharing of medications or alcohol.

Results: Seventy-seven isolation hotel residents were assessed (mean age 42 ± 14 years; 24% women). Sixty-two (81%) residents were provided medications, alcohol, or cigarettes. Seventeen residents (22%) received opioid agonist treatment (methadone, buprenorphine, or slow-release oral morphine) and 27 (35%) received hydromorphone. Thirty-one (40%) residents received prescriptions stimulants. Six (8%) residents received benzodiazepines and forty-two (55%) received alcohol. Over 14 days, mean daily dosages increased of hydromorphone (45 ± 32 – 57 ± 42 mg), methylphenidate (51 ± 28 – 77 ± 37 mg), and alcohol (12.3 ± 7.6 – 13.0 ± 6.9 standard drinks). Six residents (8%) left isolation prematurely, but four returned. During 1059 person-days, there were zero overdoses. Documented concerns regarding intoxication occurred six times (0.005 events/person-day) and medication diversion/sharing three times (0.003 events/person-day).

Conclusions: COVID-19 isolation hotel residents participating in an emergency safe supply and managed alcohol program experienced high rates of successful completion of 14 days isolation and low rates of adverse events.

Abbreviations: ABV, Alcohol by volume; BCCSU, British Columbia Centre on Substance Use; iOAT, Injectable opioid agonist treatment; MOSH, Mobile Outreach Street Health; NORS, National Overdose Response Service; OAT, Opioid agonist treatment; SROM, Slow-release oral morphine.

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1. Introduction

The COVID-19 pandemic and associated social disruptions have had a disproportionate impact on people who use drugs and/or alcohol (Bonn et al., 2020; Gomes et al., 2021a, 2021b; Dunlop et al., 2020). Changes to drug supply routes have led to an increasingly toxic and unpredictable drug supply, while physical distancing requirements cause more people to use drugs alone (where they cannot be resuscitated if they overdose) and have reduced capacity and operating hours at harm reduction and addiction treatment programs (Cowan et al., 2021; Gomes et al., 2021a, 2021b; Ali et al., 2021). People who use drugs and/or alcohol may be unable to follow public health directives to isolate if they have been exposed to COVID-19, due to withdrawal symptoms or compulsive use (Bonn et al., 2020). For people who use drugs or alcohol and are also experiencing homelessness, staying in congregate shelters increases risks of COVID-19 infection; people in this situation would be unable to isolate unless given a private place to stay (Lewer et al., 2020; Perri et al., 2020).

To facilitate physical distancing and decrease risks of COVID-19 infection, withdrawal, and overdose, Canadian clinicians developed rapid guidelines to provide a regular, safe supply of pharmaceutical-grade drugs and of beverage-grade alcohol to people who use these substances (Bach et al., 2020; BCCSU, 2020; Brar et al., 2021; Hyshka et al., 2020). The rationale for providing an alternative "safe supply" of substances to remove harms caused by reliance on the criminalized, unregulated, and poisonous drug market was first advanced by the Canadian Association of People who Used Drugs (CAPUD) (Bonn et al., 2020; Canadian Association of People Who Use Drugs CAPUD, 2019; Bonn et al., 2021) and developed clinically by Sereda and colleagues (Hales et al., 2020) and by Tyndall and colleagues (Tyndall, 2018), before the COVID-19 pandemic. Provisional prescribing of safe supply medications and managed alcohol to facilitate COVID-19-related physical distancing or isolation has also been termed "risk mitigation" or "pandemic prescribing" (Bonn et al., 2020; Chang et al., 2020; Tyndall, 2020; BCCSU, 2020; Glegg et al., 2022). The uptake of safe supply prescribing on a population level is under evaluation (McNeil et al., 2022; Young et al., 2022; Glegg et al., 2022; Nosyk et al., 2021).

Safe supply prescribing in COVID-19 isolation shelters has been reported in Toronto (Harris et al., 2021) and Hamilton (Scallan et al., 2022; Lew et al., 2022), Canada. These reports did not include descriptions of safe supply medication frequency or dosages, nor the rates of residents leaving isolation prematurely against public health orders. The Toronto program supported isolation shelter residents with emergency managed alcohol, safe supply hydromorphone, and opioid agonist treatment (OAT; methadone, buprenorphine or slow-release oral morphine [SROM]); specific medication and alcohol dosages and frequencies were not reported. They reported 4 suspected overdose deaths among 1700 admissions (0.2%), all of which were unwitnessed (Harris et al., 2021). The Hamilton program supported residents isolating at a men's congregate shelter with a flexible OAT delivery model and hydromorphone safe supply, but not managed alcohol (Lew et al., 2022). A community organization set up a supervised consumption site within the shelter where residents could consume their prescribed hydromorphone. The Hamilton program reported no fatal overdoses and three non-fatal overdoses during the month-long intervention (all of which occurred outside the safe consumption site), compared to 20 non-fatal overdoses in the month before the isolation period (Lew et al., 2022). Programs in San Francisco, USA (Fuchs et al., 2021; Ristau et al., 2021), provided OAT and managed alcohol (but not safe supply medications) in COVID-19 isolation shelters and did report isolation outcomes: 19% of residents left isolation prematurely (Fuchs et al., 2021).

In May 2021, there was a COVID-19 outbreak in the congregate shelter housing system in Halifax, Nova Scotia, Canada, and all residents in shelters experiencing COVID-19 outbreaks were moved to hotel shelters for 14 days of isolation (or quarantine). A multidisciplinary health care team provided emergency, temporary safe supply medications and beverage-grade alcohol to facilitate isolation for residents who use drugs and/or alcohol.

We aimed to describe the organization and delivery of this emergency, provisional safe supply drug and managed alcohol program in Halifax, including uptake and dosages of specific medication and alcohol options. The primary outcome was successful completion of 14 days isolation, as directed by public health orders. Adverse events included (a) overdose; (b) intoxication; and (c) diversion, selling, or sharing of medications or alcohol.

2. Material and methods

Requirements for full ethics review and individual participant consent were waived by the Nova Scotia Health Research Ethics Board, who determined this project to be quality assessment (REB FILE #: 1027156). This manuscript is reported in accordance with the Strengthening The Reporting of Observational studies in Epidemiology (STROBE) checklist (von Elm et al., 2007).

2.1. Study design and sample

This study comprises a retrospective case series of all COVID-19 isolation hotel shelter residents admitted during the May 2021 COVID-19 outbreak in the congregate shelter system in Halifax, Nova Scotia. All residents admitted during this time were referred to the health care team for assessment, were offered the emergency managed alcohol and safe supply program, and are included in the study sample whether or not they received alcohol and/or medications. As such, there was no "control group" of residents who were not offered the intervention.

2.2. Program description

People who stayed at congregate shelters identified to have COVID-19 outbreaks were moved to isolation in hotels funded by the provincial government. At this stage in the pandemic, they were mandated to isolate for 14 days under authority of the Nova Scotia *Health Protection Act*. As Nova Scotia was using a "COVID Zero" strategy, public health orders were strictly enforced with large fines for people who did not follow isolation (and/or quarantine) orders (MacDonald, 2021). Isolation hotel shelters were in the city centre, several blocks away from residents' usual congregate shelters. Residents of a given shelter typically stayed on the same hotel floor, with shelter staff continuing to support them there.

Mobile Outreach Street Health (MOSH) organized a team of physicians and nurse practitioners with experience in addiction medicine and harm reduction, established a weekly clinical care coverage schedule, and provided access to a shared digital electronic medical record. MOSH was established in 2009 to provide outreach primary care to people experiencing homelessness and people who use drugs in Halifax; the organization has long-standing relationships with the city's shelters and many of the residents. All residents being moved to isolation were referred to the harm reduction prescribing team for assessment. Nurses, nurse practitioners, and physicians performed intake assessments on substance use and health history; most assessments were done over the phone, but some were done in person. Prescribers had access to province-wide pharmacy information system to confirm patient reports of prescribed medications, including OAT (methadone, buprenorphine, or SROM). Some patients were previously seen by MOSH or the associated North End Community Health Centre, and in this case had existing medical records the team could access.

Physicians and nurse practitioners prescribed medications following the BC Centre on Substance Use (BCCSU) Guidelines: Risk Mitigation in the Context of Dual Public Health Emergencies document (BCCSU, 2020), and beverage-grade alcohol according to MOSH managed alcohol program's protocols. See Table 1 for a summary of prescribing guidance used by the MOSH team. Residents were aware that both the hotel-based

Table 1
Summary of prescribing guidelines used in emergency safe supply drug and managed alcohol program in COVID isolation hotels in Halifax.

Substance	Summary of prescribing guidance
Opioids	● Offer OAT to all patients with opioid use disorder. ● It is helpful to prescribe a long-acting opioid (e.g. slow-release oral morphine) in conjunction with a short-acting opioid for those not on OAT. ● Oral hydromorphone 8 mg tablets, 1–3 tablets every hour as needed. ● Maximum daily dose of 14 tablets (112 mg).
Stimulants	● Methylphenidate SR 20–40 mg tablets once daily and/or methylphenidate IR 10–20 mg tablets twice daily. ● Maximum daily dose of 100 mg methylphenidate. ● Dextroamphetamine SR 10–20 mg tablets twice daily and/or dextroamphetamine IR 10–20 mg tablets twice or thrice daily. ● Maximum daily dose of 80–120 mg dextroamphetamine.
Benzodiazepines	● If temporary maintenance is being prescribed, generally consider switching to a long-acting benzodiazepine (e.g. diazepam or clonazepam) and reduce dose by 50% to start and then titrate daily.
Alcohol	● Convert patient-reported alcohol consumption into "Canadian Standard Drinks". ● Most mouthwash estimated at 26% ABV, regular wine at 12% ABV, and fortified wine at 20%. ● Prescribe managed alcohol dose in number of cans of strong beer (6% ABV; 1.25 standard drinks per can) or red wine (12% ABV; 5.2 standard drinks per 750 mL bottle). Limited hard liquor (40% ABV; 0.69 standard drinks per ounce) was also available on a case-by-case basis. ● Preference is to use beer, as it can be more easily spread throughout the day.
Tobacco	● Offer nicotine replacement therapy (i.e., patch, gum, lozenge, inhaler). ● Residents requiring tobacco would be delivered 1–2 packs of cigarettes daily by a local harm reduction organization outreach team.

SR: sustained-release formulation. IR: immediate release formulation. ABV: Alcohol by volume.

private housing and the safe supply medications would only be provided for 14 days while they were isolating under Public Health orders.

Cannabis withdrawal is not mentioned in the BCCSU guidelines and the prescribing team initially underappreciated the importance of cannabis cravings and withdrawal symptoms (Bahji et al., 2020), once other needs were met. While trying to facilitate funding for cannabis deliveries to the hotels, prescribers began to offer nabilone as an agonist replacement therapy to residents with cannabis withdrawal symptoms and residents began to order their own cannabis.

Prescribed medications could be taken orally, or crushed and injected or snorted; prescribers reviewed with residents that oral tablets were not designed to be crushed and injected, and provided guidance on safer use within a harm reduction framework. Resident preferences as to specific brands or formulations (e.g. those that might be more soluble in water to facilitate safer injecting) were followed as closely as possible. Liquid hydromorphone for injection use is not included in the BCCSU guidelines and was not considered here; this oversight has been criticized by people who use drugs because of the relatively increased harms associated with injecting oral tablets (Canadian Association for Safe Supply, 2020).

Medications were delivered daily by a local community pharmacist with experience with OAT and a harm reduction philosophy of care. Alcohol was delivered daily by the MOSH managed alcohol program outreach team or dispensed by shelter staff on site. For residents who reported intense binge drinking, alcohol dispensing would be divided into two times per day.

Prescribers performed frequent phone follow-ups to adjust dosages, usually daily for the first three days and then as needed. MOSH nurses and/or prescribers would assess residents in person if needed. The team communicated via mobile secure messaging app and discussed challenging cases by phone and virtual video conferences. Mainline Needle Exchange, a local harm reduction outreach organization, provided all residents receiving safe supply medications with take-home naloxone kits, sterile drug preparation and injecting equipment, and support. No dedicated safe consumption space was created; instead, residents were encouraged to try "virtual spotting" (Perri et al., 2021) with friends or family or with the National Overdose Response Service (NORS) phone line (NATIONAL OVERDOSE RESPONSE SERVICE NORS, 2021), or otherwise to let shelter staff know they were going to be using so they could check in soon after.

There were no costs to residents at the COVID-19 isolation hotels. Medications were covered either through public drug insurance plans (for those who were enrolled) or by Nova Scotia Public Health (for those without insurance). Alcohol costs were initially covered by the MOSH managed alcohol program, and then through provincial government funding. Sterile injecting equipment and take-home naloxone kits are free to everyone in Nova Scotia, funded by the provincial government.

2.3. Measures

2.3.1. Data sources

Data were extracted from the shared electronic medical record, including progress notes, electronic prescriptions, and messaging. Using structured chart review, each resident's information was extracted in duplicate, once by a graduate student researcher (ML) and once by a clinician with experience prescribing these medications (TDB, MG, or AG). Discrepancies were resolved by TDB.

2.3.2. Descriptive characteristics

We extracted data on resident demographic characteristics including age and gender. Race and Indigenous status were not routinely evaluated in the medical assessments and therefore were not available for extraction in the medical record. We extracted data on dosages of medications dispensed and calculated daily dosages and averages among patients receiving the medications. Alcohol was converted into Canadian standard drink units (17.05 mL or 0.5765 oz of pure ethanol). Standard Drink Calculator (2021).

2.3.3. Primary outcome

The primary outcome was the frequency of residents leaving the isolation hotel shelter against public health orders before the mandatory 14 day isolation period was completed.

2.3.4. Adverse events

We extracted data on adverse events including documentation of (a) overdose; (b) intoxication; and (c) diversion, sharing, or selling of safe supply medications or alcohol. These were documented in medical records as part of prescribers' assessment and plan to continue or change dosages of medications and alcohol, based on prescribers' clinical impression (usually by telephone), by resident report, or by ad hoc descriptions by shelter support staff, the pharmacist, or the managed alcohol program outreach team.

Overdose was defined as fatal or non-fatal drug or alcohol poisoning that would require basic life support, administration of naloxone or oxygen, and/or transfer to the emergency department.

Intoxication was defined as any documentation regarding sedation (including resident report or symptoms, e.g., slowed or slurred speech, nodding off) or over-stimulation (including resident report or, e.g., pressured speech, palpitations, chest pain), whether or not it led to a change in medication or alcohol dosage.

Diversion, sharing, or selling was defined as any documentation (reported by the resident, shelter staff, or health professionals) regarding a resident providing their prescribed/dispensed substances to another person. To be as sensitive as possible, we included the presence of any documented concerns whether or not they were confirmed by the resident or another source.

2.4. Analysis

We used Microsoft Excel for data management and to calculate summary statistics and R 3.6.3 for data visualizations. We described individual trajectories by creating separate plots for each resident's daily dosages of opioids, stimulants, and alcohol. To compare different substances on the same visual scale, we transformed individual's daily dosages into a percentage of the maximum daily dosage of that substance received across the whole sample; for example, the maximum daily hydromorphone dosage across all residents was 158 mg, so an individual resident receiving 48 mg of hydromorphone in a day would have a percentage value of 16 mg ÷ 158 mg x 100% = 30% for that day.

3. Results

3.1. Participants

Over 25 days, 77 residents were admitted to COVID-19 isolation hotel shelters and referred to the medical team (Table 2). In total, there were 1059 person-days in isolation after medical assessment. Most participants were men, and average age differed by gender. Mean age for men was 46 ± 14 years, and for women was 30 ± 10 years. After intake assessment, 15 residents (19%) were determined to have no concerns about substance withdrawal or dependence while in isolation and were given no medications, alcohol, or cigarettes. Sixty-two residents (81%) were provided medications, alcohol, or cigarettes, summarized by day of isolation in Fig. 1.

Cigarettes were the most commonly provided substance (64 residents; 83% of total sample), followed by alcohol (42 residents; 55% of total sample), stimulants (31 residents; 40%), and hydromorphone tablets (27 residents; 35%). Seventeen residents (22%) received any OAT, including eight who initiated OAT medications in the isolation hotel shelters. All eight of these residents initiated SROM, and no residents initiated methadone or buprenorphine-naloxone. Twelve residents received both OAT and hydromorphone tablets on the same day (71% of residents receiving OAT); four of these residents were already on OAT before isolation. Two residents accepted offers of nicotine replacement therapy, including one resident who also had cigarettes delivered. Residents tended to either receive alcohol alone, or multiple substances (with or without alcohol); very few residents received solely opioids or stimulants (Fig. 1).

Table 2
Descriptive characteristics of the sample of residents in COVID-19 isolation.

Variable	Levels	Value
Sample size	n (%)	77 (100%)
Age, years	Mean ± SD	42 ± 14
Gender	Women, n (%)	19 (25%)
Residents provided opioid agonist treatment	Any opioid agonist treatment, n (%)	17 (22%)
	Methadone, n (%)	7 (9%)
	Buprenorphine-naloxone, n (%)	1 (1%)
	Slow-release oral morphine, n (%)	10 (13%)
Residents provided hydromorphone	n (%)	27 (35%)
Residents provided benzodiazepines	Any benzodiazepine, n (%)	6 (8%)
	Clonazepam, n (%)	5 (6%)
	Lorazepam, n (%)	1 (1%)
Residents provided stimulants	Any stimulant, n (%)	31 (40%)
	Methylphenidate, n (%)	27 (35%)
	Dextroamphetamine, n (%)	8 (10%)
	Lisdexamfetamine, n (%)	2 (3%)
Residents provided alcohol	Any alcohol, n (%)	42 (55%)
	Strong beer (6% ABV), n (%)	41 (53%)
	Wine (12% ABV), n (%)	3 (4%)
	Liquor (40% ABV), n (%)	1 (1%)
Residents provided nicotine replacement therapy	n (%)	2 (3%)
Residents provided cigarettes	n (%)	64 (83%)
Residents provided nabilone	n (%)	14 (18%)

SD: standard deviation. ABV: alcohol by volume.

3.2. Safe supply medication and managed alcohol dosages

Among the 27 residents receiving hydromorphone, average dosages increased over residents' time in isolation from day one (mean 45 mg ± 32 mg; median 32 mg; range 16–158 mg daily) to day 14 (mean 57 mg ± 42 mg; median 48 mg; range 16–158 mg daily) (Fig. 2). Three (12%) of these 27 residents were prescribed hydromorphone dosages above the BCCSU guideline suggested upper limit of 112 mg daily (14×8 mg tablets). Individual daily dosage trajectories for hydromorphone and OAT are visualized in Supplementary Fig S1, plotted as percentages of the maximum daily dosage of each medication across the whole sample. The maximum daily dosage for methadone was 195 mg, for buprenorphine was 12 mg, for SROM was 800 mg; and for hydromorphone was 158 mg.

Among residents receiving stimulants, average dosages also increased over time (Fig. 3). Methylphenidate daily dosages increased from day one (mean 51 mg ± 28 mg; median 40 mg; range 10–107 mg) to day 14 (mean 77 mg ± 37 mg; median 80 mg; range 15–160 mg). Dextroamphetamine daily dosages increased from day one (mean 33 mg ± 16 mg; median 30 mg; range 20 – 60 mg) to day 14 (mean 46 mg ± 13 mg; median 40 mg; range 30 – 60 mg). Four (15%) of 27 residents receiving methylphenidate were prescribed doses above the BCCSU guideline suggested upper limit of 100 mg daily. Of eight residents receiving dextroamphetamine, one (13%) required dosages above the guideline suggested upper limit of 120 mg daily. Individual daily dosage trajectories for stimulant medications are visualized in Supplementary Fig S2, plotted as percentages of the maximum daily dosage of each medication across the whole sample (methylphenidate 160 mg, dextroamphetamine 80 mg, and lisdexamfetamine 60 mg).

Average daily alcohol dosages increased slightly over time from day one (mean 12.3 ± 7.6 standard drinks; median 11.25 standard drinks; range 1.25–33.75 standard drinks) to day 14 (mean 13.0 ± 6.9 standard drinks; median 13.1 standard drinks; range 1.25–30.75 standard drinks) (Fig. 4). Individual daily dosage trajectories for alcohol are visualized in Supplementary Fig S3, plotted as percentages of the maximum daily dosage of alcohol across the whole sample (37.5 standard drinks).

Benzodiazepine dosages were relatively stable. Clonazepam increased slightly from day one (mean 1.67 ± 1.15; median 1 mg; range 1 – 3 mg) to day 14 (mean 2.00 ± 1.41 mg; median 1 mg; range 1–4 mg) and the only lorazepam daily dosage was stable at 1 mg. Nabilone dosages increased from mean 2 mg ± 0 mg on day one to mean 2.79 mg ± 1.25 mg on day 14, while an unknown number of residents had cannabis delivered to the isolation hotel shelters.

3.3. Primary outcome

Among the 77 isolation hotel residents, six (8%) left against public health orders. Four of these six soon returned and remained in isolation, resulting in two (3%) persistent premature discharges from isolation.

3.4. Adverse events

Over 1059 person-days in isolation, there were zero overdoses in the isolation hotel shelters. Concerns regarding intoxication were documented six times (0.005 events per person-day); four of these residents with documented intoxication were provided alcohol and four were provided opioids (three with OAT plus hydromorphone, and one with hydromorphone only). Concerns regarding diversion, sharing, or selling of medications was documented three times (0.003 events per person-day), including among two residents who also had documented intoxication. All three of these residents were provided multiple substances,

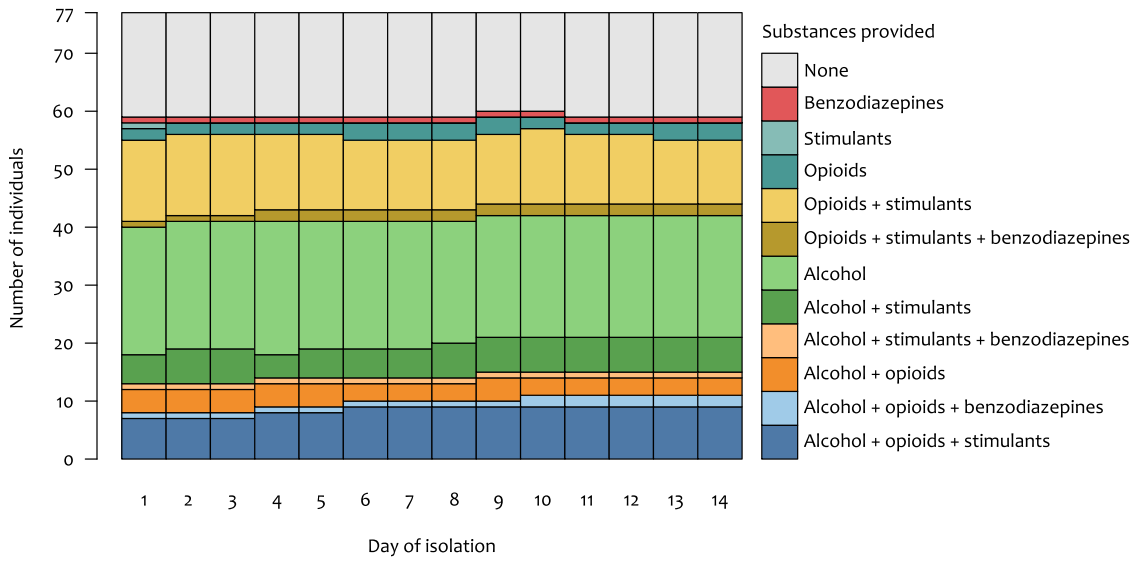

Fig. 1. Number of covid-19 isolation hotel shelter residents receiving each category of safe supply medications or managed alcohol during 14 days of isolation. Benzodiazepines include clonazepam and lorazepam. Stimulants include methylphenidate, dextroamphetamine, and lisdexamfetamine. Opioids include opioid agonist treatment medications (methadone, buprenorphine, or slow-release morphine) and hydromorphone. Alcohol includes strong beer, wine, or hard liquor.

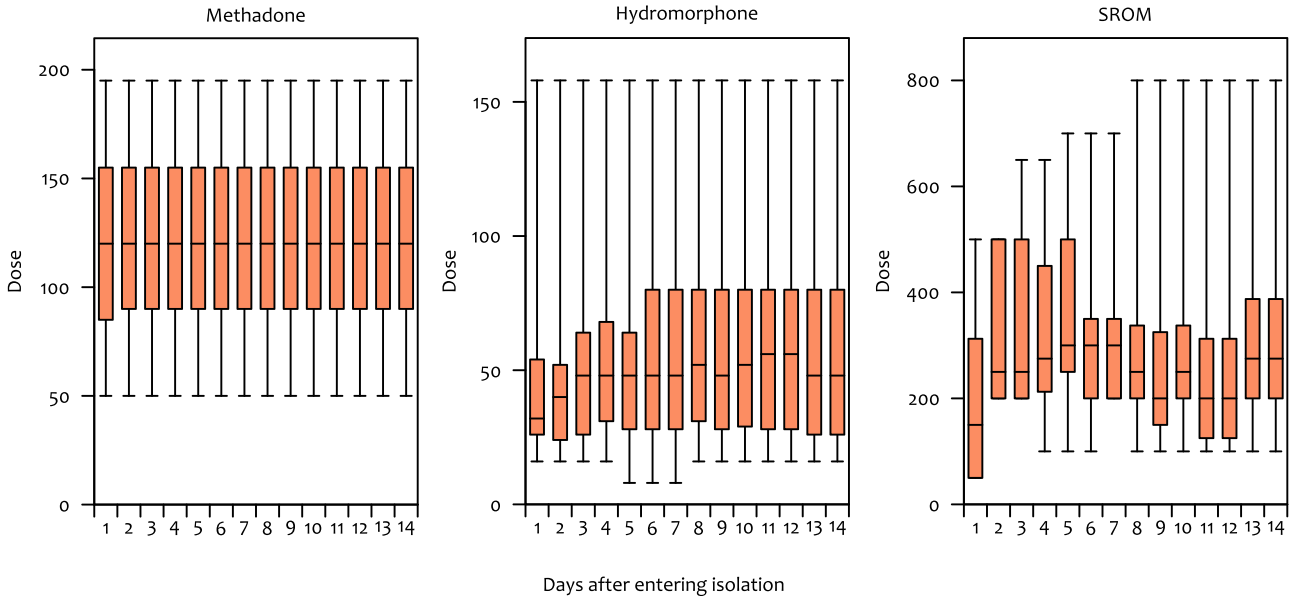

Fig. 2. Boxplot summary of daily dosages of opioid medications (methadone, hydromorphone, and slow-release oral morphine ([SROM]) received by COVID-19 isolation hotel shelter residents. Doses in milligrams.

including opioids, stimulants, and alcohol.

4. Discussion

Among residents of a COVID-19 isolation hotel shelter for people experiencing homelessness, we found that an emergency, provisional safe supply program (i.e., prescribing pharmaceutical-grade medications and beverage-grade alcohol) was associated with low rates of adverse events and high rates of successful completion of the 14-day isolation period. No shelter residents experienced an overdose during their stay. We identified medication dosage ranges that generally fell within those recommended in "risk mitigation" prescribing guidelines, which were urgently produced in response to evolving risks of COVID-19.

The prescribing practices described in this evaluation – safe supply medications and managed alcohol, for unwitnessed consumption – are a recent development. While the relative safety of medications and alcohol dispensed for unwitnessed consumption has not been previously well-described in the literature, the practice is an extension of the evidence from witnessed consumption settings (Bonn et al., 2021; Brothers et al., 2022; Tyndall, 2020; Hales et al., 2020; Bonn et al., 2021). Witnessed injectable OAT (iOAT) with liquid hydromorphone or diacetylmorphine (Heroin) has a robust evidence-based and has been incorporated into Canadian clinical practice guidelines for opioid use disorder (Oviedo-Joekes et al., 2016; Fairbairn et al., 2019). Qualitative studies have evaluated the benefits of witnessed hydromorphone tablet consumption, which is more flexible and less resource-intensive than witnessed iOAT (Ivsins et al., 2021; Ivsins et al., 2020). A recent study from Ottawa, Canada, describes positive outcomes for people with severe opioid use disorder who are provided hydromorphone iOAT along

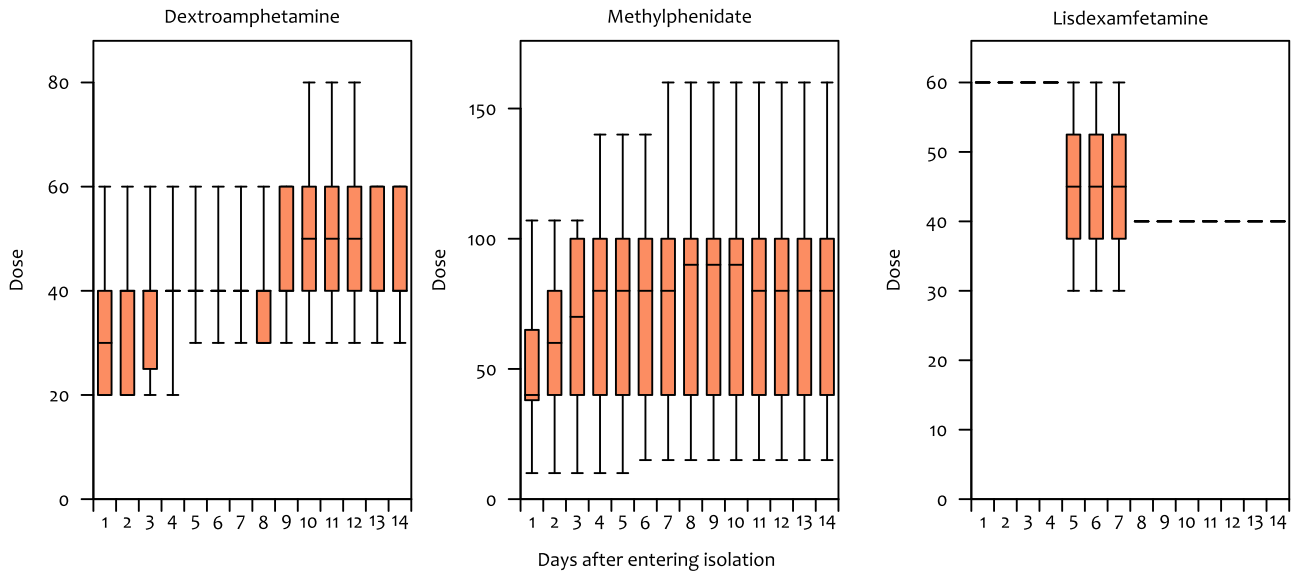

Fig. 3. Boxplot summary of daily dosages of safe supply stimulant medications (dextroamphetamine, methylphenidate, and lisdexamfetamine) received by COVID-19 isolation hotel shelter residents. Doses in milligrams.

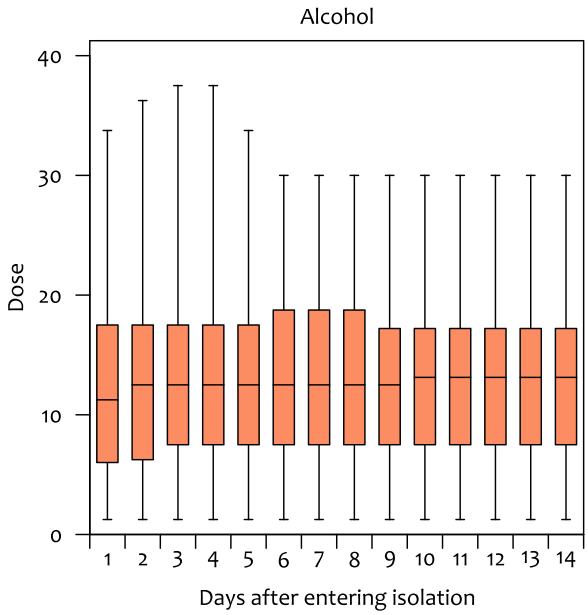

Fig. 4. Boxplot summary of daily dosages of alcohol received by COVID-19 isolation hotel shelter residents. Doses in standard drinks.

with supported housing (Harris et al., 2021). Benefits of managed alcohol programs are also clearly established for people with severe alcohol use disorder, and particularly people who drink non-beverage alcohol (Stockwell et al., 2021; Stockwell et al., 2018; Crabtree et al., 2018). Some existing managed alcohol programs include once-daily alcohol dispensing and/or unwitnessed ingestion (Pauly et al., 2018).

The dosing strategy informed by the BCCSU guidelines were appropriate for most patients in this setting (Halifax, Nova Scotia) where the illicit drug supply is comprised primarily of pharmaceutical hydromorphone and cocaine, with relatively little fentanyl and methamphetamine availability in the community compared to elsewhere in Canada (Brothers et al., 2021, 2022; Schleihauf et al., 2018; Lapointe-Gagner, 2016). Compared to Nova Scotia, British Columbia has much higher rates of illicitly manufactured fentanyl, fentanyl analogues, novel benzodiazepines, and methamphetamine availability and use (Biggar et al., 2021). People who use drugs in Nova Scotia most often use hydromorphone tablets (immediate release or extended release) and cocaine, though rates of illicitly manufactured fentanyl use are increasing (Brothers et al., 2021, 2022a,b; PHAC, 2021). Largely due to these regional differences in the illicit drug supply, British Columbia experienced a rate of opioid poisoning deaths (39.4 per 100,000 people) eight times higher than Nova Scotia (4.9 per 100,000) from January to June, 2021 (PHAC, 2021). In other settings, dosages may need to be higher than those recommended in these guidelines or different medications may be for effective. For example, a recent survey of people who use drugs in British Columbia, Canada, showed that in that province most would prefer heroin or fentanyl safe supply over prescription opioids like hydromorphone (Ferguson et al., 2022).

For the emergency safe supply program in Halifax described in our study, many residents were able to report their usual daily use of non-prescribed hydromorphone tablets which could be matched with the safe supply prescription. While the mean dosages of hydromorphone, methylphenidate, and dextroamphetamine increased over residents' 14 days in isolation, many patients stayed at the same dose throughout. As there were no overdoses and very few premature discharges from isolation, this suggests that residents knew how much medication they would need and were willing to work with the prescriber if started too low. While these medications were not offered as substance use disorder treatment, the options available to patients (in terms of medications, dosages, and brands or formulations) to help facilitate goals of successful 14 day isolation represented elements of shared decision-making and patient-centered care (Brothers et al., 2022; Marchand et al., 2019; Brothers and Bonn, 2019).

It is notable that with the broad selection of options available to avoid reliance on the criminalized drug supply, no residents chose to start methadone or buprenorphine OAT. This supports observations advanced by drug user organizations that people who use drugs need more options (beyond these traditional OAT medications) to avoid reliance on the unregulated, toxic drug supply (Bonn et al., 2020; Canadian Association of People Who Use Drugs CAPUD, 2019). These findings differ from data in other settings like acute care hospitals, where patients with medical complications of opioid use disorder may not initially be treatment-seeking, but are often motivated to engage in OAT when offered (Brothers et al., 2022; Brothers et al., 2021; Brothers et al., 2021). Prior research in the hospital setting has shown that offering more medication options (specifically SROM) in addition to

methadone and buprenorphine may increase treatment uptake (Brothers et al., 2022), but we are not aware of any published data on the role of safe supply medications for hospitalized patients. Offering safe supply medications in addition to OAT medications has been a common medical model of providing safe supply in outpatient settings in Canada (Hales et al., 2020; Glegg et al., 2022) most safe supply medications were co-prescribed with OAT in a recent evaluation from Ontario (Young et al., 2022).

Descriptions of harm reduction practices in COVID-19 isolation shelters have been reported from Toronto (Harris et al., 2021) and Hamilton (Scallan et al., 2022; Lew et al., 2022), Canada; Boston (Harris et al., 2021; Kimmel et al., 2020) and San Francisco (Fuchs et al., 2021; Ristau et al., 2021), USA; Lisbon, Portugal (Fuertes et al., 2021); and Tshwane, South Africa (Marcus et al., 2020), but safe supply medications were only provided in Toronto and Hamilton and emergency managed alcohol was only provided in Toronto and San Francisco. Some San Francisco shelter programs limited managed alcohol to a maximum dosage of 10 standard drinks per day (Ristau et al., 2021; Ristau et al., 2021), which was below the mean and median dosages for the residents in Halifax in our study. Of San Francisco residents, 19% left isolation shelters prematurely (Fuchs et al., 2021), which was higher than the 3–8% in Halifax.

The decision to revoke hotel-based private housing and safe supply medications after 14 days, despite the apparent benefits to individual residents and despite the ongoing COVID-19 pandemic, raises challenging ethical issues (Pisani, 2010; Gostin and Powers, 2006; DeBruin et al., 2012) and prevents evaluation of the potential long-term impact of these housing and safe supply interventions. These decisions were made by government and public health officials independent of the prescribers and study investigators.

Our study has important limitations. First, as the decision was made to offer all shelter residents this program for drug and alcohol withdrawal management, there is no control group of residents without this program to compare rates of adverse events or resident-initiated premature discharge from the isolation shelters against public advice. Nevertheless, the rate of premature discharge was lower here than reported in San Francisco, and our findings here of relatively safety are reassuring. Second, as our study relied on retrospective evaluation of medical records, we may be missing data on events (including medication diversion, sharing, or selling) that were not disclosed to shelter staff. The program described here did not have a systemic approach to surveillance or of gathering information on diversion, sharing, or selling, but our data did reflect the information available to prescribers. Other study designs, including qualitative interviews or ethnography, could be used to get a better sense of the scale of medication diversion, sharing, and selling, that was not reported back to the medical team. Qualitative research may also be able to explore other impacts or benefits of the program. Third, as our study occurred in a city with relatively little fentanyl and methamphetamine use, the dosing ranges here may not be sufficient in populations with higher drug tolerance, and this may limit generalizability.

5. Conclusions

We found that an emergency, provisional safe supply program providing pharmaceutical-grade medications and beverage-grade alcohol in COVID-19 isolation hotel shelters was associated with low rates of adverse events and of high rates of successful completion of the mandatory 14-day isolation stay. While the lack of a control group precludes firm conclusions about effectiveness, our findings suggest this approach to emergency safe supply and managed alcohol is safe in this setting.

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Contributors

TDB contributed to conceptualization, developed and piloted the data extraction form, performed structured data extraction, validated data extraction, data curation, data analysis, data interpretation, co-wrote the first draft, and project supervision. mL developed and piloted the data extraction form, performed structured data extraction, data curation, and data analysis, and co-wrote the first draft. DL contributed to data analysis and interpretation. AG and MG contributed to conceptualization, data extraction, and interpretation. HR-B contributed to conceptualization, data entry, data curation, data interpretation, and project administration. MB, JA, JF, LH, HH, SH, PJ, DM, TO, and LG contributed to conceptualization and data interpretation. All authors provided critical intellectual input, contributed to revised drafts, and approved the final draft for submission.

Conflict of interest

MB reports personal fees from AbbVie, a pharmaceutical research and development company, and grants and personal fees from Gilead Sciences, a research-based biopharmaceutical company, outside of the submitted work. The other authors declare that they have no competing interests.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.drugalcdep.2022.109440.

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