Edgar *et al. Harm Reduction Journal* (2025) 22:159
https://doi.org/10.1186/s12954-025-01311-y

Harm Reduction Journal

REVIEW Open Access

Interventions for stimulant use in people who are homeless or vulnerably housed: a scoping review of the evidence including trauma-informed approaches

Nicole E. Edgar[1], Housam Taha[1], Valentina Ly[2] and Simon Hatcher[1,3*]

Abstract

Background Stimulant use has been increasing globally over the past decade. People using drugs are now most often using both opioids and stimulants. In Canada, stimulants were involved in 68% of overdose deaths from 2020 to 2024. The overdose crisis has disproportionately impacted people experiencing homelessness. People experiencing homelessness are more likely to experience an overdose and stimulants are more likely to contribute directly to an overdose death in this population. Despite the growing need, a comprehensive and effective treatment program for people experiencing homelessness who use stimulants, that also considers trauma and safe supply options, is non-existent. We conducted a scoping review to identify the types of evidence-based treatments available to address stimulant use in people experiencing homelessness; whether any of these services were trauma-informed; and to identify knowledge gaps.

Methods Using a peer-reviewed search strategy, we conducted searches in MEDLINE, Embase, PsychInfo via OVID, CINAHL, Global Health via EBSCOhost, and Scopus. Grey literature sources were hand searched. We included any primary research study with no restrictions on language or date. Reporting follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist.

Results After de-duplication, 2914 titles and abstracts were screened, and 51 papers were moved to full text screening. Of this, 31 studies met eligibility criteria and were included for data extraction. Papers examined contingency management interventions (n = 20), residential treatment programs (n = 5), safer supply (n = 1), and other types of interventions (n = 4). Of the 31 papers, no studies reported using trauma-informed care approaches, although, seven incorporated some components of trauma-informed care. There was mixed evidence of effectiveness among studies, with rewards-based contingency management being generally effective and acceptable to participants.

Discussion There is limited evidence available regarding stimulant use treatments for people experiencing homelessness, with most studies focusing on contingency management. Studies largely do not consider the effects

*Correspondence:
Simon Hatcher
shatcher@toh.ca

Full list of author information is available at the end of the article

of trauma in their intervention or study design. Further research is needed on harm reduction interventions such as stimulant safer supply or supervised consumption services, as well as outcomes other than abstinence that may be important to this population.

Keywords Stimulant use, Homelessness, Trauma-informed care

Background

The 2024 UN World Drug Report found that more than 292 million people reported using illicit drugs in 2022, an increase of 20% over the past decade, with more than 30 million using stimulants [1]. In Canada, the 2023 Canadian Substance Use Survey found that nearly 8% of respondents had used illegal substances in the past 12 months, with 28% of those reporting polysubstance use [2]. However, this survey had significant methodological shortcomings, including for example that only respondents who could be reached by phone were eligible to participate. As such, this is likely a substantial under-counting of the rates of illicit drug use nationwide. While much of the focus in substance use treatment and policy continues to centre around opioids, psychostimulant use in North America has steadily trended upwards over the past 20 years, with a sharp increase occurring in the last 5 years [3]. Data from a 2019 Harm Reduction Client Survey found that 71% of respondents were using crystal meth compared to less than half of respondents using any opioid [4]. In contrast, this same survey administered in 2018 found only 59.7% of people were using crystal meth [4]. However, this survey was limited to those seeking harm reduction services, which again may be an underestimate as people using stimulants often access harm reduction services at lower rates than people using opioids [5].

Of particular concern, is the overdose crisis which continues to affect North America, with rates of drug overdose deaths steadily increasing each year [3, 6]. Despite much of the response to this crisis being focused on opioids, stimulant use has also been associated with an increase in morbidity and mortality from complications related to a toxic drug supply [7, 8]. People using drugs are now most often using both opioids and stimulants [8] and it is becoming increasingly clear that opioid and stimulant related deaths cannot be treated as mutually exclusive crises. Stimulants, such as cocaine and methamphetamine, were found in up to 68% of opioid-related overdose deaths in Canada from 2020 to 2024 [8, 9]. Among people who use stimulants, those who are opioid-naive and those who use opioids concurrently, are at increased risk of overdose death due to the potency of fentanyl and related compounds that are increasingly found in the drug supply [9].

The overdose crisis has disproportionately impacted people experiencing homelessness (PEH). Rates of substance use and substance use disorders are consistently higher among PEH [10–12] and they are more likely to experience negative outcomes compared to people who are housed [13, 14]. In Canada, the most recent national Point-in-Time Count found that in 2022, 18% of respondents indicated that substance use was a reason for their housing loss and 61% of respondents had challenges with substance use, with the proportion of individuals reporting health challenges increasing the longer someone was homeless [15]. Further, PEH are more likely to experience an overdose involving stimulants, and stimulants were also more likely to contribute directly to an overdose death in PEH than in housed individuals [8]. In Ontario, PEH also had a 271% increase in opioid overdose deaths from 2017 to 2021, compared to only a 61% increase in housed individuals [14].

Comprehensive treatment options for stimulant use are limited. For PEH, treatment options are reduced even further as they are often initiated or delivered in inpatient or residential settings creating barriers to access [9]. Treatments for stimulant use typically consist of psychological approaches involving twelve step facilitation, cognitive behavior therapy or contingency management. A recent systematic review found there was only sufficient evidence to recommend contingency management [16], where positive reinforcements, frequently monetary rewards, are used to promote behavioural changes such as abstinence [17], while a review of treatments for amphetamines made no recommendations for pharmacological treatments as a result of inconsistent evidence of effectiveness [18]. Other wrap-around approaches to stimulant use treatment such as Housing First strategies, where PEH are offered accommodation in longer-term, stable housing (with or without supports), while promising, have demonstrated mixed effectiveness in reducing substance use [19–24]. Two systematic reviews found that while housing interventions improved some health outcomes, they had no significant impact on substances use outcomes [20, 21]. Further, Canadian Housing First trials have found that comparison groups experienced a greater decrease in severe drug problems after 2 years [19] and at 4 years found no difference in substance use between the groups [23]. In contrast, other studies of Housing First interventions have shown early reductions in substance use, which have been mostly observed in alcohol and cannabis use [22, 25, 26].

There are also a number of barriers to accessing treatment, which include stigma or embarrassment about seeking help; preferring to withdraw on their own; low

confidence in available treatment options; concerns regarding relevancy and effectiveness of treatment services for methamphetamine use, especially those not tailored to people using stimulants and that include people using opioids; concerns about confidentiality and privacy; and belief that treatment was unnecessary [27]. Further, the COVID-19 pandemic significantly exacerbated issues of accessing treatments for stimulant use. Most harm reduction and treatment programs had reduced capacity during restrictive stages of the pandemic [28, 29], resulting in substantial increases in wait times to access care [29, 30]. Many services also shifted to a virtual care delivery model, creating additional barriers for patients who did not have access to electronic devices or a private space to have medical appointments [29, 31]. Lastly, other structural changes during the pandemic disproportionately impacted PEH and people using drugs in accessing services including changes to public transit, mandatory quarantines, restricted access to a preferred substance, and access to other social supports important in help-seeking [32].

Harm reduction approaches for stimulant use are also limited. Common approaches include safe smoking or injecting supplies, supervised consumption sites (in some areas), education on personal hygiene (like oral health) and drug checking services [33–35]. People who use stimulants are less likely to carry a naloxone kit [36, 37], and other approaches to address the risk of fatal overdose, such as a safer supply of prescribed stimulants, are not common [9, 38, 39]. The potential advantages of stimulant safer supply include reduced mortality, a reduction in abscesses from injection, reduced transmission of infectious diseases, reduced criminality to fund drug use, and engagement with health and social providers. The issue of safer supply programs is still controversial for some, with negative perceptions of safer supply programming from the general public and political representatives persisting. Concerns driving the ongoing hesitancy to implement safer supply programs include the potential diversion of prescribed medications [40, 41], issues of safety and other social adversities in neighbourhoods where programs exist [42], potential unintended negative effects [43, 44] such as increased hospitalizations, and that these programs discourage people from accessing other treatment [45]. Currently, there is limited evidence for stimulant safer supply programs.

People who use drugs have highlighted the importance of considering mental health, and in particular the effects of trauma, in substance use treatment [46]. Studies have consistently found that 40–60% of people who have a stimulant use disorder also have another Diagnostic and Statistical Manual of Mental Disorders (5th Edition) (DSM-5) diagnosis [47, 48]. In particular, studies have shown strong links between early trauma exposure and substance use [49]. This is particularly pronounced in PEH where adverse childhood experiences or early trauma exposure is a nearly universal experience [50]. The acknowledgement of trauma in treatment recognizes that trauma can impact how people access and engage with services, including the view that services or care providers may be unsafe, and that programs cannot be one size fits all. This recognition of the impacts of trauma in treatment is referred to as trauma-informed care and is defined as:

> *"a program, organization, or system that realizes the widespread impact of trauma and understands potential paths for healing; recognizes the signs and symptoms of trauma in staff, clients, and others involved with the system; and responds by fully integrating knowledge about trauma into policies, procedures, practices, and settings"[51].*

Trauma-informed care consists of several core principles including: awareness of the effects of trauma, safety, choice, empowerment and a strengths-based approach [52]. Trauma-informed care can and should be applied to treatment of any condition where a history of trauma is known to be a risk factor, even when the treatment of the trauma is not the focus of the intervention [53, 54].

For PEH who use stimulants, a comprehensive and effective treatment program that also considers trauma and safer supply options is non-existent [9]. Much of the harm reduction and overdose literature has focused on reducing opioid-related overdose and deaths, while the importance of stimulant use has been largely overlooked. We chose to do a scoping review to identify the types of evidence-based treatments available to address stimulant use in PEH; assess whether any of these services were trauma-informed; and to identify knowledge gaps. We chose to focus on PEH given their over-representation in stimulant use and overdose statistics, their unique treatment needs, and the disproportionate burden faced by this community.

Rationale and objectives

This scoping review aims to provide an overview of the literature addressing stimulant use within adults who are vulnerably housed or homeless. Within the context of this review, we have opted to use the terms vulnerably housed or homeless as they are more specific and inclusive terms than PEH in that they include all forms of precarious housing or houselessness, including those who are unsheltered or sleeping rough, provisionally accommodated, or at imminent risk of homelessness [55]. The specific research questions guiding this scoping review are:

(1) What interventions for stimulant use disorder (including safer supply) for people who are homeless or vulnerably housed have been reported in the literature, including their effectiveness or other related outcomes (employment, housing etc.)?
(2) Are any of these described as trauma-informed and how were they operationalized?
(3) How have these interventions been affected by the COVID-19 pandemic?

To gain a comprehensive picture of the current evidence available for stimulant treatment for people who are homeless or vulnerably housed, we examined outcomes of effectiveness, acceptability, and feasibility including: substance use outcomes (for example abstinence), engagement and retention, treatment satisfaction, employment and housing outcomes, adverse events, and quality of life.

Methods

Study design

We conducted a scoping review following the methodological framework proposed by Arksey and O'Malley [56] in addition to the methods manual published by the Joanna Briggs Institute's Methodology for Scoping Reviews [57]. For reporting our review, we used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist (Additional File 1) [58]. The protocol is registered with the Open Science Framework (https://osf.io/9kgam).

Information sources and search strategy

A comprehensive search strategy was established by an experienced health science librarian (VL). We conducted searches in MEDLINE, Embase, and PsycInfo via Ovid, CINAHL and Global Health via EBSCOhost, and Scopus. Grey literature sources, such as medRxiv and thesis repositories, were hand searched for non-indexed literature. The search was peer reviewed following the Peer Review of Electronic Search Strategies (PRESS) guidelines [59]. The full search strategy is available in an additional file (Additional File 2). The search was run on February 22, 2023 and repeated on March 4, 2024. No limits were applied to language or publication date. The reference list of identified reports and articles was hand searched for additional relevant studies that were not captured in the initial search.

Study selection: inclusion criteria

We included quantitative, qualitative and mixed-methods published and non-peer reviewed primary research studies that examined stimulant use and related treatment programs, including safer supply, implementation of stimulant treatment programs and changes to these treatment programs since the COVID-19 pandemic. For this review, the population was those who were 18 years of age or older, with stimulant use and who were homeless or vulnerably housed. Vulnerably housed populations are defined as those who are unsheltered, emergency sheltered, provisionally accommodated, and/or at risk of homelessness [60]. Collectively, we consider people who were vulnerably housed or experiencing homelessness to be PEH. Studies that involved patients under the age of 18, those with a primary focus on opioid treatment and studies that did not report results by housing status were excluded. Patients under the age of 18 were excluded as adult and youth populations do not access treatment through the same systems and the needs of the two populations are often different [61]. While the definition of youth experiencing homelessness typically includes young people aged 13–24, the age cutoff to access most youth services is by age 18. As the review was looking to identify treatments targeted at adults, youth focused treatments were excluded using an age cutoff of 18. Similarly, as the focus of this review was on PEH, only studies that included this factor in their reporting were eligible for inclusion. Eligible study designs included randomized controlled trials (RCTs), cluster RCTs, quasi-experimental studies, cohort studies, mixed-methods studies, qualitative studies, cross-sectional/survey studies, case studies & controlled before and after studies. We excluded reviews, commentaries, and editorials. Reviews were excluded so that the primary data from each study could be examined to best answer our research questions.

Study selection: screening process

From the results of our comprehensive search strategy, we obtained the titles and abstracts from all references, with citations uploaded to Covidence Systematic Review software (Veritas Health Innovation, Melbourne, Australia. Available at www.covidence.org). Screening was completed in two stages—titles and abstracts (phase I) followed by full-text screening (phase II) to identify relevant studies. All studies were screened by two independent reviewers (NE, HT) following the inclusion and exclusion criteria. Prior to each stage of screening, the reviewers ran pilot screening on 5% of citations to identify and address any inconsistencies in applying the inclusion and exclusion criteria. Disagreements between the two reviewers were resolved through consensus or discussion with a third reviewer (SH).

Data abstraction

All included full-text studies were reviewed and abstracted by two independent reviewers using a pilot-tested data abstraction form in Covidence review software. Data that was abstracted included study design and

characteristics, population characteristics, details about the intervention, whether or not a trauma-informed approach was used, and key findings. Any discrepancies between reviewers were resolved through discussion, or if consensus could not be reached, through a third reviewer (SH).

The charting process included organizing and interpreting data by sifting, categorizing, and sorting material according to key issues and themes [56]. Data was organized by intervention type (contingency management, residential treatment, safer supply, and other treatments).

We evaluated if the treatment was delivered using a trauma-informed approach by examining whether any of the four components of trauma-informed care were incorporated in the design or delivery of the treatment. We used the components of trauma-informed care as outlined by Hopper et al. (2010), which included (i) trauma awareness; (ii) emphasis on safety; (iii) opportunities to rebuild control; and (iv) strengths-based approach. We chose to use the Hopper et al. framework as it is evidence-based and centres specifically around providing trauma-informed care to PEH. Studies were marked as "Yes" if they stated they used trauma-informed approach. Studies that used at least one component of a trauma-informed approach but did not explicitly state a trauma-informed approach, were marked as "partial".

Results

The literature search resulted in 5367 citations. After de-duplication, 3146 unique titles and abstracts were screened during phase I, of which 2859 citations were excluded and 59 were moved to phase II full-text screening. A total of 31 articles met our inclusion criteria. The details of the screening and selection process are presented in our PRISMA flow diagram (Fig. 1).

Most studies were conducted in the United States (n = 25), as well as Brazil (n = 3), Canada [2], and The Netherlands (n = 1). We identified 19 RCTs, four secondary analyses of RCTs, two observational studies, two cohort studies, one case series, one pre-post non-randomized design, one pilot trial, and one A-B-A research design. Studies were published between 1996 and 2022. All studies were published in English. Only one study addressed the impact of COVID-19 [62], and one noted its impact on their follow-up data collection [63]. Four key types of interventions were identified: contingency management, residential treatment, safer supply, and alternative interventions. A description of all studies included can be found in Table 1.

Contingency management

Contingency management was the most frequently identified intervention in our review, with 20 studies using contingency management as all or part of their intervention. In the contingency management interventions, participants received monetary rewards, housing or work for abstinence or other health promoting behaviours. Of the 20 studies identified, 10 were conducted by the Milby et al. research group based in Birmingham, Alabama, United States, which evaluated various iterations of contingency management-based interventions.

Eight studies from this research group used enhanced contingency management strategies in their trials, which included receiving behavioural treatment, goal setting, and/or psychoeducation as an enhanced care approach or day treatment, as well as abstinent-contingent housing (ACH) [64–70]. Many also included the use of abstinent contingent work therapy [64–66, 68–70]. Comparator groups included contingency management with no additional treatment [66, 69], treatment alone [64, 65, 68, 70, 71], or non-abstinent contingent services [67]. Results consistently demonstrated treatment groups having improved outcomes including reduced drug use, an increase in the number of days housed, and improvements in employment. However, the significance of results was highly variable with some studies finding non-significant reductions in drug use [66, 70] or days homeless [69, 70], significant reductions in drug use [64, 65, 67, 68, 71] or days homeless [71], and significant [69] or non-significant [71] improvements in employment.

A pooled analysis of three contingency management focused RCTs [64–67], conducted by Vuchinich et al. examined seven different treatment conditions (day treatment, day treatment with ACH, ACH alone, non-abstinent contingent housing alone, no housing, ACH with vocational training, and contingency management with day treatment) tested in the original trials [72]. They found that participants who were abstinent during treatment had the same probability of being abstinent at 1 year follow-up, regardless of which treatment arm they had received [72].

Two studies examined the role of trauma in the context of contingency management treatments. In their dissertation, Lester completed a secondary analysis of the Milby et al. 2008 RCT of contingency management with day treatment, ACH and abstinent-contingent work therapy [66], and the prevalence and impact of trauma on cocaine use [73]. They found that rates of exposure to trauma were high (85% of the sample), but a diagnosis of post-traumatic stress disorder (PTSD) did not seem to impact treatment outcomes. They did note that the number of episodes of homelessness seemed to have the biggest impact on cocaine use. Additionally, those receiving contingency management with day treatment also had more improvement in their PTSD symptoms [73]. Burns et al. 2010 also used data from the Milby et al. 2008 RCT [66] to examine the role for trauma-specific interventions [74]. They found those who did not experience

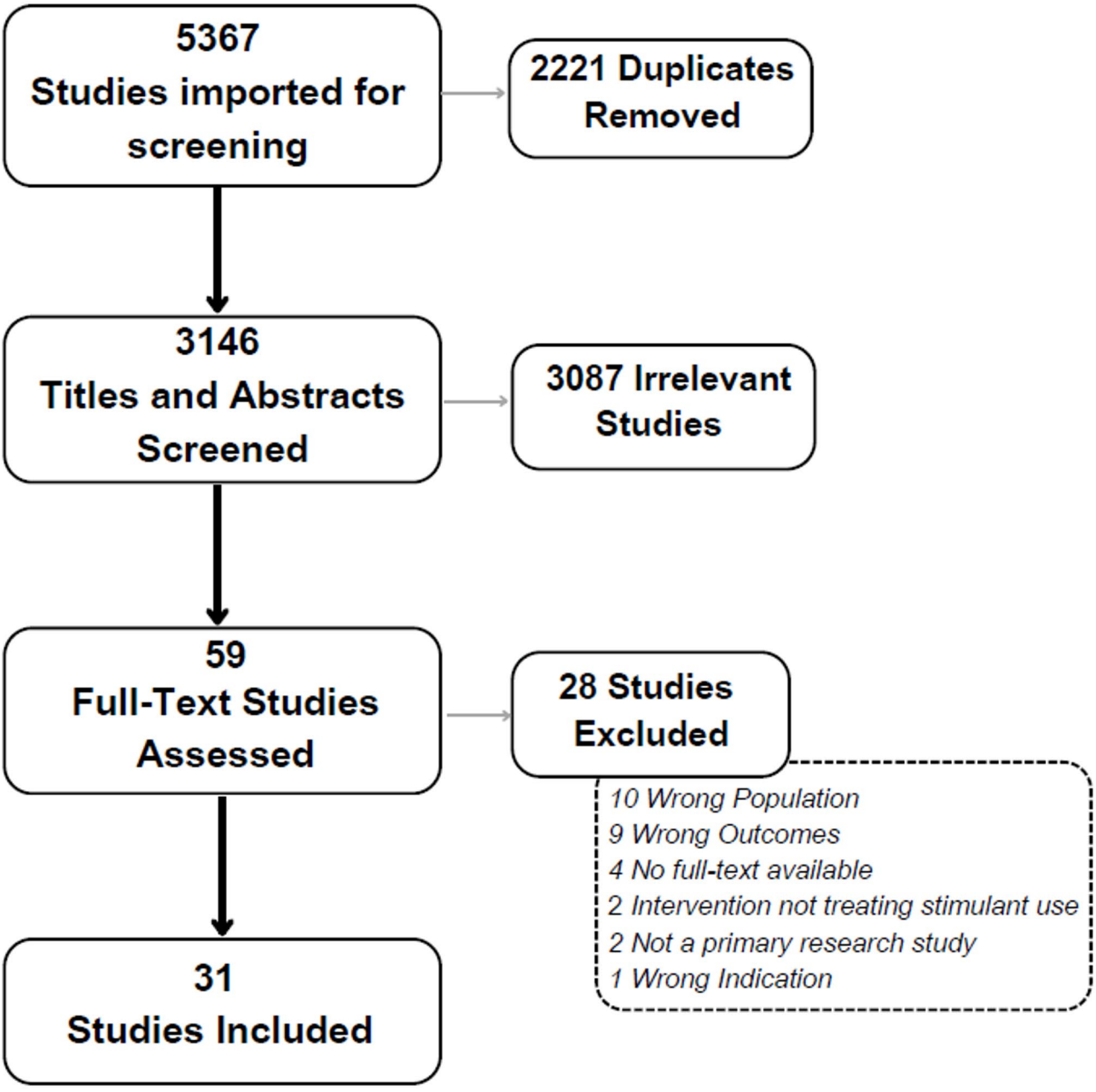

Fig. 1 PRISMA Flow Diagram

improvement in their trauma symptoms over the course of their substance treatment were more likely to use substances more often during and after treatment [74].

Two RCTs, Zhang et al. [75] and Nyamathi et al. [76], examined community-based interventions for men who have sex with men experiencing homelessness compared with scheduled monetary rewards for negative urine samples with a nurse-led education program combined with contingency management. Both studies found that both groups experienced large decreases in stimulant use for up to 8 months [75, 76]. Zhang also found that both groups experienced a decrease in risky sexual behaviours at 8 months [75]. A third study in men who have sex with men experiencing homelessness compared contingency management to a no intervention control, found that introducing contingency management resulted in more stimulant negative urine samples over 24 weeks, as well as an increase in other health promoting behaviours [77].

Corsi et al. conducted a pilot study to examine the feasibility of contingency management in PEH and using methamphetamines [78]. Participants were randomized to contingency management alone or contingency management plus strengths-based case management (CM/SBCM). SBCM included helping participants identify

Table 1 Characteristics of included studies

Author (year)	Country	Study design	Sample size	Mean age (SD)/ Range (years)	Sex/Gender	Substances Used	Intervention	Trauma-informed approach?
Bernstein et al.(2005) [89]	USA	RCT	778	Intervention 37.8 (8.3) Control 38.1 (8.2)	Intervention 30.6% female Control 28.2% female	53% used cocaine only, 7% used opiates only, and 40% used both	Brief motivational interview	Partial
Brothers et al. (2022) [62]	Canada	Retrospective Case Series	77	42 (14)	25% women	40% of the population were provided stimulant replacements	Safe supply	Partial
Burns et al. (2010) [74]	USA	RCT	152	40.1 (7.1)	72.3% male	100% cocaine; 0–31 years of use	CM	Partial
Conners et al. (2001) [87]	USA	"Evaluation"	62	16–44	Not reported but womens treatment program	Most identified crack/cocaine as their primary drug	Residential treatment program	No
Corsi et al. (2012) [78]	USA	Pilot RCT	45	38.00 (8.64)	51.7% male	All participants tested positive for meth at baseline; 84.5% amphetamine positive; 22.4% cocaine positive	CM plus strengths-based case management intervention (CM/SBCM)	Partial
de Andrade Boska et al. (2022) [93]	Brazil	Non-randomized experimental study	122	44 (10.3)	Cisgender man = 79.5% Cisgender woman = 18.9% Transgender man = 0.8% Transgender woman = 0.8%	Baseline use Cocaine use = 7.18 days (10.18) in past 30 Crack use = 7.76 days (11.25) in past 30	Community based psychosocial care	Partial
Doré-Gauthier et al. (2020) [92]	Canada	Cohort study	50	Intervention Group = 24.1 (3.0) TAU group = 23.6 (3.5)	Intervention Group = 91.7% male TAU Group = 92.3% male	Cocaine use—25% in both groups Amphetamine use 40% in intervention and 30% in TAU group	Intensive case management	No
Henskens et al. (2005) [91]	Netherlands	Secondary analysis of RCT	33	37.5 (5.3); 27–48 years	46% men	Crack cocaine (100%)	Outpatient treatment	No
Kertesz et al. (2007) [69]	USA	Secondary analysis of RCT	138	Median (IQR) ACH: 38 (34–43) NACH: 41 (36–47) No housing: 38.5 (34–43)	ACH: 25.4% female NACH: 24.2% female No housing: 24.2% female	All participants used cocaine in 2 weeks prior	Behavioural treatment & CM	No
Lester et al. (2007) [73]	USA	RCT	196	40 (7.1); range 20–57	73% male	99% met cocaine dependence criteria; 1% met cocaine abuse criteria	Behavioural treatment & CM	No
McNamara et al. (2001) [70]	USA	RCT	128	37.7 (7.1)	76.6% male	Cocaine disorder (96.9%), including crack cocaine use	Behavioural day treatment, ACH & work therapy	No
Miguel et al. (2021) [79]	Brazil	RCT	21	46	81% male	Crack cocaine (100%)	CM	No
Miguel et al. (2022) [63]	Brazil	RCT	98	38.7 (9.5)	84.7% male	Cocaine positive urinalysis = 51% Multiple substance use disorders = 3.5%	CM + URH	No

Table 1 (continued)

Author (year)	Country	Study design	Sample size	Mean age (SD)/ Range (years)	Sex/Gender	Substances Used	Intervention	Trauma-informed approach?
Milby et al. (2000) [65]	USA	RCT	84	38.2 (7.4); Range = 20–65	76.3% male	Cocaine use was eligibility criteria 93.8% met DSM-III-R criteria for substance use disorder	Behavioural day treatment, ACH and work therapy	No
Milby et al. (1996) [71]	USA	RCT	131	35.7 (6.2) (Usual Care) 36.0 (6.6) (Enhanced Care)	87.1% male (usual care) 72.5% male (enhanced care)	71.8% were primarily crack cocaine abusers	Day treatment model (enhanced care)	No
Milby et al.(2003) [64]	USA	RCT	100	37.7 (7.1)	72% male	Cocaine 81%	Behavioural treatment & CM	No
Milby et al. (2008) [66]	USA	RCT	206	[By group] CM = 39.5 (7.2) CM+ = 40.6 (7.1)	[By group] CM—74.8% male C+—70.9% male	Length of cocaine abuse by group CM—12.4 (7.0) years CM+—11.4 (6.0) years	CM plus extensive day treatment (CM+)	No
Milby et al. (2005) [67]	USA	RCT	196	NH = 38.2 (7.4) NACH = 40.9 (7.2) ACH = 38.4 (6.7)	NH—76% NACH—76% ACH—75%	All participants had self-reported cocaine use in the past 2 weeks	Housing and CM	No
Nyamathi et al. (2012) [90]	USA	RCT	100	21.2 (2.4)	70% male	7.3% used crack, 17.1% used cocaine, 41.5% used methamphetamine	Nurse-Led HIV/AIDS and Health Promotion (HHP) Program ***or*** Art Messaging Program (AM)	Partial
Nyamathi et al. (2017) [76]	USA	RCT	367	34.42 (8.1) Range = 18–46	All men*	Methamphetamine = 73%; Amphetamines = 48.3% Cocaine = 33.9%	Nursing case management (NCM) plus CM	Partial
Rash et al.(2017) [82]	USA	Pooled analysis of RCTs	355	[By group] Accessed Housing = 37 (8) No housing = 37 [7]	50% male in both groups	Cocaine, alcohol and stimulant use were included Both groups had 11 years of cocaine use	CM	No
Reback et al.(2010) [77]	USA	RCT	105	36.4 (8.7)	100% men	Methamphetamine dependence—63.4% Cocaine dependence—6.1% Crack dependence—19.1%	CM	No
Schumacher et al. (2003) [68]	USA	RCT	127	38.0 (7.3)	73.2% male	80.3% cocaine use	Day treatment plus ACH	No
Shaner et al. (1997) [80]	USA	A-B-A Design	2	Both participants were 41	Both participants were male	Both participants were cocaine users	CM	No
Stahler et al. (1997) [83]	USA	Program Evaluation	36	30.0 Range = 20–39	All female	> 90% smoked crack for > 1 year; average age of initiation of cocaine use being 19 years old	Intensive residential treatment	No

Table 1 (continued)

Author (year)	Country	Study design	Sample size	Mean age (SD)/ Range (years)	Sex/Gender	Substances Used	Intervention	Trauma-informed approach?
Stahler et al. (1995) [86]	USA	RCT	549	32.6	"Men"	"Primarily crack cocaine" 77% used cocaine, 20% used alcohol 3% used "other" 11 days of cocaine use in past 30	Group 1—residential treatment; Group 2—shelter-based case management	No
Stahler et al. (2005) [85]	USA	Pre-test post-test design	111	32.7 (5.4)	All women	Primary drug was cocaine, with about half reporting using cocaine at least 15 days of the past 30	Residential treatment program plus Bridges program	No
Stahler et al. (2007) [84]	USA	RCT	18	32.4	All women	100% used cocaine, 11.5 days average in past 30 days	Residential treatment program plus Bridges program	No
Tracy et al. (2007) [81]	USA	RCT	30	Not reported	Not reported	Years of cocaine use: CM group 17.73; Control 8.60; Days of use past 30: CM 7.33; Control 2.60**	CM	No
Vuchinich et al. (2009) [72]	USA	Pooled analysis of RCTs	543	39.1 (7.1)	73.3% men	Cocaine use (per eligibility criteria)	CM	No
Zhang et al. (2018) [75]	USA	RCT	398	34.31	100% gay/ bisexual men	Methamphetamine—89.47% Cocaine—57.89% Amphetamines—36.84%	CM & NCM	No

*Nyamathi et al. 2017—author excluded 29 transgender men from main analysis as they felt they were a unique subgroup

** Tracy et al. 2007 – CM and control groups showed between group differences for cocaine use history ($p=0.02$) and use in past 30 days ($p=0.009$)

Contingency Management (CM); Abstinence-contingent housing (ACH); non-abstinence contingent housing (NACH); no housing (NH); nursing case management (NCM)

strengths, encouraging participants to set their own goals, organizing needed resources or services, and helping to identify personal resources. Participants in CM/SBCM attended more sessions, earned more vouchers, and had more negative urine samples, although this was not significantly different from contingency management alone [78].

Miguel et al. (2022)[also examined the feasibility of incorporating contingency management into an existing public drug treatment program at Unidade Recomeço Helvétia (URH) [63]. Both groups received the URH program which consisted of access to basic self-care, group activities and self-help groups, as well as a trained outreach counsellor. The intervention group (URH plus contingency management) also received monetary vouchers of increasing value for each negative urine sample provided. Participants in the intervention group submitted negative urine samples more often, had more continuous weeks of abstinence from cocaine and remained in treatment longer [63]. Miguel et al. (2021) also examined the addition of contingency management to the ACH component of the URH program [79]. All participants had access to ACH but were randomized to receive contingency management or not. Participants in the contingency management with ACH condition showed more improvement with respect to cocaine use than the ACH alone group. Participants also reported high acceptability of the intervention, describing that they found the contingency management easy to understand, liked receiving the intervention, and believed it had a positive effect on their treatment response by helping them achieve and/or maintain crack cocaine abstinence and by improving their socioeconomic condition [79].

Lastly, three studies examined contingency management alone. One study used an A-B-A case series, where two men with co-occurring psychosis and cocaine use received monetary incentive ($25) for negative urine samples, five times per week for eight weeks. Both participants showed high proportions of negative urine samples (81% and 77%). The authors note the limitations of the small sample, but describe it as laying the ground work for larger trials [80]. Two studies examined contingency management alone compared to either assessment [81] or usual care [82]. Both studies found that those receiving contingency management experienced longer periods of abstinence or fewer days of drug use. Rash et

al. also found that participants in the contingency management arm stayed in treatment longer [82].

Residential treatment

We identified five papers that utilized a residential treatment program (without any contingency management component). Three of these papers assessed a program called "Bridges", which was designed to support Black women with children who were using primarily crack cocaine, as an adjunct to residential treatment [83–85]. These studies focused on two components: a comprehensive residential treatment program and the Bridges adjunct program. The residential treatment program consisted of four phases involving: (i) stabilization; (ii) education, individual and group counselling; (iii) vocational training; and (iv) preparation for community reintegration. Near the end of stage two, participants were introduced to the adjunct Bridges program, which was designed to partner the women with a peer advisor and introduce culturally relevant activities. The program was designed to reduce the alienation and isolation that the women had often reported feeling while going through drug treatment. In their initial 1997 publication, Stahler et al. presented preliminary results which showed that approximately 50% of the participants completed the program, maintaining sobriety and residing in independent housing [83]. In their 2005 pre-post non-randomized trial, they compared the residential program alone to residential plus Bridges on treatment outcomes. They found that while both groups had significant improvement in their cocaine use, women in the Bridges program reported no cocaine use for a longer duration. Women in the Bridges treatment group also had higher rates of treatment completion (93.5%) compared to the residential program (37.0%) ($p = 0.000$) [85]. In their final study, a small RCT (n = 18), they again compared Bridges plus residential treatment to residential treatment alone with similar outcomes. The Bridges program retained more women than residential treatment alone (88% vs 40%), and Bridges women provided more cocaine-free urine samples at six-month follow-up (75% vs 30%, $p = 0.05$) [84].

A large RCT (n = 722) of men using primarily crack cocaine and experiencing homelessness, which examined the effectiveness and predictors of treatment of either a comprehensive residential treatment program (group 1), intensive shelter-based case management (group 2) or shelter care as usual (group 3), was also identified [86]. Group 1 involved individual and group therapy, life and job skills training, and educational training. Group 2 had access to a case manager with a case load of about 15, who assisted in linkages to community services and promoted sober living. Group 3 had standard care, which involved a case manager (with a load of about 50–75) who found support services and assisted with finding housing. They found no significant treatment differences between groups, with all groups showing improvement, but with the caveat that participants were much more satisfied with treatment in Group 1 [86].

Lastly, Conners et al. examined a residential treatment program for parenting women [87]. Their program included education, individual and group counselling, parenting and life skills training. They found that women who completed the program were less likely to relapse than early or late drop-outs ($p = 0.003$). Program completers were more likely to be employed ($p = 0.01$) and showed improved parenting experiences ($p = 0.008$). Graduates were also less likely to be arrested or to be experiencing homelessness (although these were not significant) [87].

Safer supply

Only one study was identified that evaluated the provision of stimulant safer supply. Brothers et al. conducted a chart review to describe the implementation of an emergency safer supply program in Nova Scotia during COVID-19 [62]. People staying in the Nova Scotia shelter system who contracted COVID-19 were required, by law, to isolate at a hotel for a period of 14 days. During isolation, participants were offered access to stimulant safer supply, prescribed as per the *British Columbia Centre on Substance Use (BCCSU) Guidelines: Risk Mitigation in the Context of Dual Public Health Emergencies* clinical guidance document [88]. Participants received doses of methylphenidate or dextroamphetamine, as per the guidance document, with the majority of participants not exceeding the upper limit of this guidance, with average dosages increasing over time. There were no overdoses. The program was not available after the 14-day isolation period was over. However, the short evaluation period and the lack of a control group meant it was challenging to make broad conclusions about effectiveness or large-scale implementation [62].

Alternative interventions

Five studies with alternative interventions were identified, including brief motivational interviewing, a nurse-led intervention, an artist-led intervention, as well as outreach and integrated care interventions. Bernstein et al. examined the impact of a peer-delivered brief motivational intervention, compared to a handout that listed treatment options, to reduce cocaine use in an RCT [89]. Intervention participants completed a brief semi-structured interview, received referrals and a booster phone call at 10 days. They found that 22.3% of participants in the intervention group were abstinent from cocaine at 6 months post-intervention, compared to 16.9% of the controls ($p = 0.045$). There was also a non-significant

reduction in cocaine use among intervention participants compared to controls ($p = 0.058$) [89].

Another study compared two treatment groups: a nurse-led HIV/AIDS and Health Promotion (HHP) group and an arts-based intervention. The HHP examined risks of HIV and hepatitis, health promoting behaviour, skills training, and the development of supports. The arts-based intervention encouraged youth to create art with messages related to health and drug-use. The program also provided an important means of involving youth in a healthy relationship with a caring adult. There were no significant differences in stimulant use between the two programs, with both showing a reduction in stimulant use [90].

A secondary analysis of an RCT of an outpatient treatment program in The Netherlands, which involved outreach and case management including crack cocaine-related education, medical care, social services, and psychosocial counseling, was also included. The analysis assessed gender differences in response to treatment [91]. They found that, at baseline, women were typically in poorer health, suffered from more chronic health conditions, and typically had longer periods of abstinence. They found no gender differences in compliance with care or retention in the intervention. However, they did note differences in treatment outcomes with men having less days per month with cocaine abuse, less severe drug problems, and a reduction in service needs, while women had a reduced attachment to the hard drug scene and decreased anxiety. Both men and women experienced a reduction in unstable housing [91].

Another outreach-centred project examined the impact of an assertive community intervention program based in Montreal, Canada, which consisted of an interdisciplinary team offering intensive case management to youth with first episode psychosis and stimulant use [92]. They compared this intervention group to a retrospective cohort receiving standard care. They found that the intervention group reached housing stability sooner and were at lower risk of abuse or dependence on cocaine at 24 months [92].

Lastly, de Andrade Boska et al. examined the impact of integrated care on PEH and abusing crack cocaine in a Brazilian region with significant challenges with crack cocaine use [93]. The program they assessed involved a highly diverse multidisciplinary team of physicians, nurses, nursing technicians, psychologists, social workers, occupational therapists, physical educators, workshops, pharmacists and harm reducers. The program offered community-based outpatient care and a night service to reduce hospitalizations and improve continuity of care for patients. They found that there was a significant decrease in crack cocaine use at two study timepoints, however this was non-significant. They also found a significant improvement in quality of life, but no improvement in housing status [93].

Trauma-informed care approaches

No studies reported using a trauma-informed care approach and very few (n = 6/31) incorporated at least 1 component of trauma-informed care. All four components of trauma informed care were addressed across studies with "rebuilding control" being the most common (n = 5); followed by strengths-based approaches (n = 2), safety (n = 2), and trauma-awareness (n = 1). Burns et al. noted the importance of control in interventions accounting for trauma, as well as noting that the day treatment offers programming similar to the Seeking Safety program, which is partially trauma-informed [74, 94]. Bernstein et al. described that for their intervention peers were used to establish trust and reduce barriers for participants, as well as reintroducing elements of control to the participant [89]. Brothers et al. also detailed how they provided participants opportunities for choice within the intervention by using participant preference with respect to drug formulation and method of use (with the exception of smoking) [62]. Corsi et al. used a strengths-based approach, but only for their intervention arm, as well as offering opportunities to rebuild control by addressing needs only when the client was ready [78]. de Andrade Boska et al. highlighted that their program "defends people's freedom and autonomy" in seeking care, and as such, provides opportunities for participants to rebuild control [93]. Nyamathi et al. described using participant-led group sessions (with respect to content), working with participants to set their own goals and the use of the groups to establish a healthy relationship with a caring adult, which all work to emphasize safety and rebuild control [90]. In a subsequent study, they also demonstrated trauma awareness and safety by engaging gay and bisexual community service attendees in the design of study communications, integrating community members in the design and implementation of the programs as peers employed and trained to deliver the content, and conducting the study in the community sites attended by these clientele [76]. Further, three additional studies reported on rates of trauma or PTSD, indicating they are potentially trauma-aware, but it is unclear if or how this was taken into account for the intervention, so we did not consider them as partially trauma-informed [70, 91, 92].

Discussion

This review identified 31 papers examining interventions for stimulant use in people experiencing homelessness, with few having clear evidence of effectiveness in reducing stimulant use or improving other related outcomes. Contingency management was the most frequently

identified intervention, and, while a theoretically sound strategy, has many ethical issues. For example, making housing, which is generally seen as a human right, contingent on not using stimulants is not ethical in a Canadian, or similar, context. While most contingency management interventions examined here had mixed evidence, it seems that contingency management programs with rewards, rather than punishments, may have some value and appear to be acceptable to participants, especially if delivered by peers. However, it is still unclear what the optimal size of the reward should be, how frequently it should be given, whether rewards should taper up or down over time or how long the contingency management should be in place to produce lasting results. A further limitation of contingency management is that it can only be offered to users who want to achieve abstinence rather than reducing their use.

There is far less literature on residential treatment programs, with only three programs identified as providing services specifically for PEH. These programs are costly and there is little evidence that these programs are better than non-residential treatment. There is promising evidence of the effectiveness of motivational interviewing delivered by peers, although this is in comparison to information only. More well-designed trials are needed to examine the effectiveness of this intervention compared to current treatment options. Outreach and case management studies found mixed effectiveness with mostly non-significant improvements in stimulant use and housing stability. There was no evidence reported on the effectiveness of stimulant safer supply, but in the one paper that utilized this approach, there did not appear to be any increase in adverse events in the short-term.

The effect of experiencing trauma and the use of trauma-informed care approaches is largely absent from the literature and rarely integrated into treatment approaches, despite its importance being highlighted both by people with lived experience [46] and in care guidelines [95]. We identified no studies that reported using a trauma-informed approach or which used all four components of trauma-informed care. Only 20% of studies used any component of trauma informed care. In most studies, when trauma was considered, it was as a risk factor for continued substance use, rather than as something that requires consideration in its own right. It should be noted that there were no studies of harm reduction or supervised consumption services for stimulants identified in this review, despite patient perspectives that they may be an important component of care [96, 97].

The results of this scoping review highlight the limited effective treatment options for PEH who use substances, consistent with existing literature describing the lack of treatments [9, 16]. Further, the existing literature focuses on abstinence or reduced use as important outcomes, although these may not be the most important things for patients. Factors such as improved quality of life, increased income, or less legal or police involvement may be more important [98]. There is also little attention paid to the stage of change of patients when entering treatment programs, for example whether they are pre-contemplators or not. Considering whether people are at a stage to engage in the behavioural components of a treatment, may increase their long-term success [99].

Our review is not without limitations. First, there was limited geographic spread of studies, with the majority being conducted in the United States. As such, results may not be generalizable or relevant to other countries. Second, the confirmation and measurement of stimulant use was highly variable between studies. Some studies relied on self-report, some used clinician interviews, and others used chemical analysis to confirm stimulant use or abstinence.

A lack of qualitative studies identified fails to explore the experiences of participants in treatment and to understand what outcomes are important to them and their goals around substance use. Future research should focus on incorporating the lived experience perspective during design to ensure interventions are acceptable and that outcomes are meaningful. Future work should also incorporate and evaluate the effect of trauma-informed care approaches in treatment for stimulant use.

Conclusion

The findings of this review have identified several gaps in the treatment of stimulant use for PEH, including a lack of trauma-informed approaches, a lack of global research (including Canada), and a focus on abstinence-related outcomes over wellbeing or harm reduction. With nearly two-thirds of papers focusing on contingency management, of which nearly one-third were published by a single research group, there is a need for more high-quality studies of existing and novel interventions, as well as a focus on outcomes other than abstinence. In particular, more research is needed on the role of supervised consumption services and safer supply programs for people who primarily use stimulants. Further, the findings of this review need to be applied to the Canadian setting and, specifically, considered in the context of the existing Housing First model. This scoping review suggests that when people who have been homeless and using stimulants move into housing that a strategy that incorporates treatment for the effects of trauma and trauma-informed care; utilizes motivational interviewing involving peers; and for those who want to pursue abstinence, employing rewards-based contingency management, may be a potential way forward. The issues of housing and substance use are intimately intertwined, and we know

from reviews of Housing First that housing alone doesn't improve mental health or substance use problems. Given the co-occurring housing and drug crises, we need a pathway to move forward with comprehensive stimulant treatment and this review suggests a strategy for incorporating it into an updated Housing First approach.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12954-025-01311-y.

Supplementary Material 1

Supplementary Material 2

Acknowledgements
The authors would like to acknowledge the contributions of Dr. Heather Orpana, Dr. Geneviève Gariépy, Dr. Eva Graham, Sarah MacLean, and Kisanet Kebedom on this project.

Author contributions
This research was conceptualized by SH, while NEE and HT contributed to the study design. Search Strategy and searches were completed by VL. While title, abstract and full screenings, and data extraction were carried out by NEE and HT under guidance from SH. Manuscript was drafted by NEE and SH. Critical review of manuscript was undertaken by all authors. All authors approved the final manuscript.

Funding
This review was funded by the Public Health Agency of Canada (PHAC).

Data availability
All data generated or analysed during this study are included in this published article [and its supplementary information files].

Declarations

Competing interests
The authors have no competing interests to declare.

Author details
[1]Neurosciences Program, Ottawa Hospital Research Institute, 1919 Riverside Drive, Suite 406, Ottawa, ON K1H 7W9, Canada
[2]Health Sciences Library, University of Ottawa, 451 Smyth Rd #1020, Ottawa, ON K1H 8M5, Canada
[3]Department of Psychiatry, University of Ottawa, 1145 Carling Avenue, Room 5458, Ottawa, ON K1Z 7K4, Canada

Received: 28 March 2025 / Accepted: 5 September 2025
Published online: 03 October 2025

References

1. UNODC. World Drug Report 2024. Vienna, Austria; 2024.
2. Infobase. GoCH. Canadian substance use survey (CSUS): data tool 2023 [updated 18 March 2025. Available from: https://health-infobase.canada.ca/substance-use/csus/.
3. Fischer B. The continuous opioid death crisis in Canada: changing characteristics and implications for path options forward. Lancet Regional Health. 2023. https://doi.org/10.1016/j.lana.2023.100437.
4. Papamihali K, Collins D, Karamouzian M, Purssell R, Graham B, Buxton J. Crystal methamphetamine use in British Columbia, Canada: a cross-sectional study of people who access harm reduction services. PLoS ONE. 2021;16(5):e0252090.
5. Bandara S, Byrne L, Berman V, Hurst A, King D, Gibbons JB, et al. Harm reduction and treatment among people at high risk of overdose. JAMA Netw Open. 2024;7(8):e2427241.
6. Meyer M, Westenberg JN, Jang KL, Choi F, Schreiter S, Mathew N, et al. Shifting drug markets in North America: a global crisis in the making? Int J Ment Health Syst. 2023;17(1):36.
7. Black JC, Bau GE, Iwanicki JL, Dart RC. Association of medical stimulants with mortality in the US from 2010 to 2017. JAMA Intern Med. 2021;181(5):707–9.
8. Public Health Agency of Canada. Opioid- and stimulant-related harms in Canada - Public Health Infobase 2024 [updated 07 March 2025. Available from: https://health-infobase.canada.ca/substance-related-harms/opioids-stimulants/.
9. Fleming T, Barker A, Ivsins A, Vakharia S, McNeil R. Stimulant safe supply: a potential opportunity to respond to the overdose epidemic. Harm Reduct J. 2020;17(6):1–6.
10. Hwang SW. Homelessness and health. CMAJ2001.
11. Stergiopoulos V, Hwang SW, Gozdzik A, Nisenbaum R, Latimer E, Rabouin D, et al. Effect of scattered-site housing using rent supplements and intensive case management on housing stability among homeless adults with mental illness: a randomized trial. JAMA. 2015;313(9):905–15.
12. Coombs T, Abdelkader A, Ginige T, Van Calster P, Harper M, Al-Jumeily D, et al. Understanding drug use patterns among the homeless population: a systematic review of quantitative studies. Emerg Trends Drugs, Addict, Health. 2024;4:100059.
13. Gaber SN, Franck J, Widing H, Hällgren J, Mattsson E, Westman J. Excess mortality among people in homelessness with substance use disorders: a Swedish cohort study. J Epidemiol Community Health. 2024;78(8):473–8.
14. Booth RA-O, Shariff SZ, Carter B, Hwang SW, Orkin AM, Forchuk C, et al. Opioid-related overdose deaths among people experiencing homelessness, 2017–2021: a population-based analysis using coroner and health administrative data from Ontario Canada. Addiction. 2024;119(2):334–44.
15. Government of Canada. Everyone counts 2020-2022: results from the third nationally coordinated point-intime counts of homelessness in Canada. Ottawa, Canada; 2024
16. Ronsley C, Nolan S, Knight R, Hayashi K, Klimas J, Walley A, et al. Treatment of stimulant use disorder: a systematic review of reviews. PLoS ONE. 2020;15(6):e0234809.
17. Petry NM. Contingency management: What it is and why psychiatrists should want to use it. Psychiatrist. 2011;35(5):161–3.
18. Lee NK, Jenner L, Harney A, Cameron J. Pharmacotherapy for amphetamine dependence: a systematic review. Drug Alcohol Depend. 2018;191:309–37.
19. Cherner RA, Aubry T, Sylvestre J, Boyd R, Pettey D. Housing first for adults with problematic substance use. J Dual Diagn. 2017;13(3):219–29.
20. Baxter AJ, Tweed EJ, Katikireddi SV, Thomson H. Effects of housing first approaches on health and well-being of adults who are homeless or at risk of homelessness: systematic review and meta-analysis of randomised controlled trials. J Epidemiol Community Health. 2019;73(5):379–87.
21. Aubry T, Bloch G, Brcic V, Saad A, Magwood O, Abdalla T, et al. Effectiveness of permanent supportive housing and income assistance interventions for homeless individuals in high-income countries: a systematic review. Lancet Public Health. 2020;5(6):e342–60.
22. Ferreiro IC, Cuadra MAR, Serqueda FA, Abad JMH. Impact of housing first on psychiatric symptoms, substance use, and everyday life skills among people experiencing homelessness. J Psychosoc Nurs Ment Health Serv. 2022;60(9):46–55.
23. Loubière S, Lemoine C, Boucekine M, Boyer L, Girard V, Tinland A, et al. Housing first for homeless people with severe mental illness: extended 4-year follow-up and analysis of recovery and housing stability from the randomized un chez soi d'abord trial. Epidemiol Psychiatr Sci. 2022;31:e14.
24. Tsai J. Is the housing first model effective? Different evidence for different outcomes. Am J Public Health. 2020;110(9):1376–7.
25. Padgett DK, Stanhope V, Henwood BF, Stefancic A. Substance use outcomes among homeless clients with serious mental illness: comparing housing first with treatment first programs. Community Ment Health J. 2011;47(2):227–32.
26. Tsemberis S, Kent D, Respress C. Housing stability and recovery among chronically homeless persons with co-occuring disorders in Washington, DC. Am J Public Health. 2012;102(1):13–6.
27. Cumming C, Troeung L, Young JT, Kelty E, Preen DB. Barriers to accessing methamphetamine treatment: a systematic review and meta-analysis. Drug Alcohol Depend. 2016;168:263–73.
28. Saloner B, Krawczyk N, Solomon K, Allen ST, Morris M, Haney K, et al. Experiences with substance use disorder treatment during the

COVID-19 pandemic: findings from a multistate survey. Int J Drug Policy. 2022;101:103537.
29. Canadian Centre on Substance Use and Addiction. Impacts of the COVID-19 pandemic on substance use treatment capacity in Canada. 2020.
30. 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.
31. Komaromy M, Tomanovich M, Taylor JL, Ruiz-Mercado G, Kimmel SD, Bagley SM, et al. Adaptation of a system of treatment for substance use disorders during the COVID-19 pandemic. J Addict Med. 2021;15(6):448–51.
32. McCann V, Allen R, Purkey E. Exploring the impact of COVID-19 on substance use patterns and service access of street involved individuals in Kingston, Ontario: a qualitative study. BMC Public Health. 2022;22(1):571.
33. Pinkham S, Stone K. A global review of the harm reduction response to amphetamines: A 2015 Update. Harm Reduction International; 2015 October 2015.
34. Chan CA, Canver B, McNeil R, Sue KL. Harm reduction in health care settings. Med Clin North Am. 2022;106(1):201–17.
35. Bourque S, Pijl EM, Mason E, Manning J, Motz T. Supervised inhalation is an important part of supervised consumption services. Can J Public Health. 2019;110(2):210–5.
36. Bandara S, Byrne L, Berman V, Hurst A, King D, Gibbons JB, et al. Harm reduction and treatment among people at high risk of overdose. JAMA Netw Open. 2024;7(8):e2427241-e.
37. Moustaqim-Barrette A, Papamihali K, Crabtree A, Graham B, Karamouzian M, Buxton JA. Correlates of take-home naloxone kit possession among people who use drugs in British Columbia: a cross-sectional analysis. Drug Alcohol Depend. 2019;205:107609.
38. Palis H, MacDonald S. Incorporating prescription psychostimulants into the continuum of care for people with stimulant use disorder in Canada. Can Med Assoc J. 2023;195(27):E934–5.
39. Fleming T, Ivsins A, Barker A, Mansoor M, Mayer S, Vakharia S, et al. Perceptions of prospective pharmaceutical stimulant substitution treatments among people who use illicit stimulants in Vancouver, Canada. Int J Drug Policy. 2024;125:104336.
40. Health Canada. Early findings from safer supply pilot projects. 2022 17 March 2022.
41. Fischer B, Robinson T. Safer drug supply measures in Canada to reduce the drug overdose fatality toll: clarifying concepts, practices and evidence within a public health intervention framework. J Stud Alcohol Drugs. 2023;84(6):801–7.
42. Karamouzian M, Rafat B, Kolla G, Urbanoski K, Atkinson K, Bardwell G, et al. Challenges of implementing safer supply programs in Canada during the COVID-19 pandemic: a qualitative analysis. Int J Drug Policy. 2023;120:104157.
43. Nguyen HV, Mital S, Bugden S, McGinty EE. British Columbia's safer opioid supply policy and opioid outcomes. JAMA Intern Med. 2024;184(3):256–64.
44. Ledlie S, Garg R, Cheng C, Kolla G, Antoniou T, Bouck Z, et al. Prescribed safer opioid supply: a scoping review of the evidence. Int J Drug Policy. 2024;125:104339.
45. del Pozo B, Rawson RA. Putting the horse before the unicorn: a safe supply strategy should begin with partial agonists: a commentary on Bonn et al. (2020). J Stud Alcohol Drugs. 2020;81(5):562–3.
46. Maté G. In the realm of hungry ghosts: close encounters with addiction. Las Vegas: North Atlantic Books; 2008.
47. Burdzovic Andreas J, Lauritzen G, Nordfjærn T. Co-occurrence between mental distress and poly-drug use: a ten year prospective study of patients from substance abuse treatment. Addict Behav. 2015;48:71–8.
48. Santucci K. Psychiatric disease and drug abuse. Curr Opin Pediatr. 2012;24(2):233–7.
49. Leza L, Siria S, López-Goñi JJ, Fernández-Montalvo J. Adverse childhood experiences (ACEs) and substance use disorder (SUD): a scoping review. Drug Alcohol Depend. 2021;221:108563.
50. Buhrich N, Hodder T, Teesson M. Lifetime prevalence of trauma among homeless people in Sydney. Aust N Z J Psychiatry. 2000;34(6):963–6.
51. Initiative. SsTaJS. SAMHSA's concept of trauma and guidance for a trauma-informed approach. 2014.
52. Hopper EK, Bassuk EL, Olivet J. Shelter from the storm: trauma-informed care in homelessness services settings. Open Health Serv Policy J. 2010;2:131–51.
53. Griffin J, Whitley SD, Wiegand TJ, Stancliff SL, Monroe AK, Norton BL, et al. Substance use harm reduction in medical care. New York State department of health AIDS institute clinical guidelines. Baltimore (MD) 2025.
54. Stillerman A, Altman L, Peña G, Cua G, Goben A, Walden AL, et al. Advancing trauma-informed care in hospitals: the time is now. Perm J. 2023;27(1):16–20.
55. Calgary Homeless Foundation. Homelessness 101 [Available from: https://www.calgaryhomeless.com/discover-learn/learn-about-homelessness/homelessness-in-calgary/homelessness-101/.
56. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005;8(1):19–32.
57. Peters M, Godfrey C, McInerney P, Munn Z, Tricco A, Khalil H. Scoping reviews. In: Aromataris E, Lockwood C, Pilla B, editors. JBI manual for evidence synthesis. London: JBI; 2020.
58. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med. 2018;169(7):467–73.
59. McGowan J, Sampson M, Salzwedel DM, Cogo E, Foerster V, Lefebvre C. PRESS peer review of electronic search strategies: 2015 guideline statement. J Clin Epidemiol. 2016;75:40–6.
60. Gaetz S. The real cost of homelessness: Can we save money by doing the right thing? Toronto: Canadian Homelessness Research Network Press; 2012.
61. Buchnea A, Kellway E. The case for youth homelessness and homelessness prevention in the UNECE region. Toronto; 2024.
62. Brothers TD, Leaman M, Bonn M, Lewer D, Atkinson J, Fraser J, et al. Evaluation of an emergency safe supply drugs and managed alcohol program in COVID-19 isolation hotel shelters for people experiencing homelessness. Drug Alcohol Depend. 2022. https://doi.org/10.1016/j.drugalcdep.2022.109440.
63. Miguel AQC, McPherson SM, Simões V, Yamauchi R, Madruga CS, Smith CL, et al. Effectiveness of incorporating contingency management into a public treatment program for people who use crack cocaine in Brazil. A single-blind randomized controlled trial. Int J Drug Policy. 2022;99:103464.
64. Milby JB, Schumacher JE, Frison S, McNamara C, Usdan S, Wallace D, et al. Day treatment with contingency management for cocaine abuse in homeless persons: 12-month follow-up. J Consult Clin Psychol. 2003;71(3):619–21.
65. Milby JB, Schumacher JE, McNamara C, Wallace D, Usdan S, McGill T, et al. Initiating abstinence in cocaine abusing dually diagnosed homeless persons. Drug Alcohol Depend. 2000;60(1):55–67.
66. Milby JB, Schumacher JE, Vuchinich RE, Freedman MJ, Kertesz S, Wallace D. Toward cost-effective initial care for substance-abusing homeless. J Subst Abuse Treat. 2008;34(2):180–91.
67. Milby JB, Schumacher JE, Wallace D, Freedman MJ, Vuchinich RE. To house or not to house: the effects of providing housing to homeless substance abusers in treatment. Am J Public Health. 2005;95(7):1259–65.
68. Schumacher JE, Milby JB, Simpson C, Frison S, McNamara C, Wallace D, et al. Diagnostic compared with abstinence outcomes of day treatment and contingency management among cocaine-dependent homeless persons. Exp Clin Psychopharmacol. 2003;11(2):146–57.
69. Kertesz SG, Mullins AN, Schumacher JE, Wallace D, Kirk K, Milby JB. Long-term housing and work outcomes among treated cocaine-dependent homeless persons. J Behav Health Serv Res. 2007;34(1):17–33.
70. McNamara C, Schumacher JE, Milby JB, Wallace D, Usdan S. Prevalence of nonpsychotic mental disorders does not affect treatment outcome in a homeless cocaine-dependent sample. Am J Drug Alcohol Abuse. 2001;27(1):91–106.
71. Milby JB, Schumacher JE, Raczynski JM, Caldwell E, Engle M, Michael M, et al. Sufficient conditions for effective treatment of substance abusing homeless persons. Drug Alcohol Depend. 1996;43(1–2):39–47.
72. Vuchinich R, Wallace D, Milby JB, Schumacher JE, Mennemeyer S, Kertesz S. Relations between in-treatment and follow-up abstinence among cocaine-dependent homeless persons in three clinical trials. Exp Clin Psychopharmacol. 2009;17(3):165–72.
73. Lester KM. Posttraumatic stress disorder (PTSD) in cocaine-dependent homeless in treatment: a study of substance use and PTSD-related outcomes. Dissertation Abstracts International: Section B: The Sciences and Engineering. 2007.
74. Burns MN, Lehman KA, Milby JB, Wallace D, Schumacher JE. Do PTSD symptoms and course predict continued substance use for homeless individuals in contingency management for cocaine dependence? Behav Res Ther. 2010;48(7):588–98.
75. Zhang SX, Shoptaw S, Reback CJ, Yadav K, Nyamathi AM. Cost-effective way to reduce stimulant-abuse among gay/bisexual men and transgender women: a randomized clinical trial with a cost comparison. Public Health. 2018;154:151–60.

76. Nyamathi A, Reback CJ, Shoptaw S, Salem BE, Zhang S, Yadav K. Impact of tailored interventions to reduce drug use and sexual risk behaviors among homeless gay and bisexual men. Am J Mens Health. 2017;11(2):208–20.
77. Reback CJ, Peck JA, Dierst-Davies R, Nuno M, Kamien JB, Amass L. Contingency management among homeless, out-of-treatment men who have sex with men. J Subst Abuse Treat. 2010;39(3):255–63.
78. Corsi KF, Lehman WE, Min SJ, Lance SP, Speer N, Booth RE, et al. The feasibility of interventions to reduce HIV risk and drug use among heterosexual methamphetamine users. J AIDS Clin Res. 2012;1(10):6953.
79. Miguel AQC, Simões V, Yamauchi R, Madruga CS, da Silva CJ, Laranjeira RR, et al. Acceptability and feasibility of incorporating contingency management into a public treatment program for homeless crack cocaine users in Brazil: a pilot study. Exp Clin Psychopharmacol. 2021;30(5):507–13.
80. Shaner A, Roberts LJ, Eckman TA, Tucker DE, Tsuang JW, Wilkins JN, et al. Monetary reinforcement of abstinence from cocaine among mentally ill patients with cocaine dependence. Psychiatr Serv. 1997;48(6):807–10.
81. Tracy K, Babuscio T, Nich C, Kiluk B, Carroll KM, Petry NM, et al. Contingency management to reduce substance use in individuals who are homeless with co-occurring psychiatric disorders. Am J Drug Alcohol Abuse. 2007;33(2):253–8.
82. Rash CJ, Alessi SM, Petry NM. Substance abuse treatment patients in housing programs respond to contingency management interventions. J Subst Abuse Treat. 2017;72:97–102.
83. Stahler GJ, Godboldte C, Shipley TE, Shandler IW, Ijoy L, Weinberg A, et al. Preventing relapse among crack-using homeless women with children: building bridges to the community. J Prev Interv Community. 1997;15(2):53–66.
84. Stahler GJ, Kirby KC, Kerwin MLE. A faith-based intervention for cocaine-dependent Black women. J Psychoactive Drugs. 2007;39(2):183–90.
85. Stahler GJ, Shipley TE, Kirby KC, Godboldte C, Kerwin MLE, Shandler I, et al. Development and initial demonstration of a community-based intervention for homeless, cocaine-using, African-American women. J Subst Abuse Treat. 2005;28(2):171–9.
86. Stahler GJ, Shipley TF, Bartelt D, Ducette JP, Shandler IW. Evaluating alternative treatments for homeless substance-abusing men: outcomes and predictors of success. J Addict Dis. 1995;14(4):151–67.
87. Conners NA, Bradley RH, Whiteside-Mansell L, Crone CC. A comprehensive substance abuse treatment program for women and their children: an initial evaluation. J Subst Abuse Treat. 2001;21(2):67–75.
88. Use BCCoS. Clinical guidance risk mitigation in the context of dual public health emergencies. 2020.
89. Bernstein J, Bernstein E, Tassiopoulos K, Heeren T, Levenson S, Hingson R. Brief motivational intervention at a clinic visit reduces cocaine and heroin use. Drug Alcohol Depend. 2005;77(1):49–59.
90. Nyamathi A, Branson C, Kennedy B, Salem B, Khalilifard F, Marfisee M, et al. Impact of nursing intervention on decreasing substances among homeless youth. Am J Addict. 2012;21(6):558–65.
91. Henskens R, Mulder CL, Garretsen H, Bongers I, Sturmans F. Gender differences in problems and needs among chronic, high-risk crack abusers: results of a randomized controlled trial. J Subst Use. 2005;10(2–3):128–40.
92. Doré-Gauthier V, Miron JP, Jutras-Aswad D, Ouellet-Plamondon C, Abdel-Baki A. Specialized assertive community treatment intervention for homeless youth with first episode psychosis and substance use disorder: a 2-year follow-up study. Early Interv Psychiatry. 2020;14(2):203–10.
93. de Andrade BG, de Ferreira Oliveira MA, Carvalho Seabra PR. The impact of integrated care in community-based substance use treatment in Brazil: a longitudinal study. Health Soc Care Community. 2022;30(4):e1325.
94. Bennett A, Crosse K, Ku M, Edgar NE, Hodgson A, Hatcher S. Interventions to treat post-traumatic stress disorder (PTSD) in vulnerably housed populations and trauma-informed care: a scoping review. BMJ Open. 2022;12:e051079.
95. Pottie K, Kendall CE, Aubry T, Magwood O, Andermann A, Salvalaggio G, et al. Clinical guideline for homeless and vulnerably housed people, and people with lived homelessness experience. CMAJ. 2020;192(10):E240-e54.
96. Forchuk C, Serrato J, Scott L. People with lived and living experience of methamphetamine use and admission to hospital: What harm reduction do they suggest needs to be addressed? Health Promot Chronic Dis Prev Can. 2023;43(6):338–47.
97. McNeil R, Kerr T, Lampkin H, Small W. "We need somewhere to smoke crack": an ethnographic study of an unsanctioned safer smoking room in Vancouver, Canada. Int J Drug Policy. 2015;26(7):645–52.
98. Ruefli T, Rogers SJ. How do drug users define their progress in harm reduction programs? Qualitative research to develop user-generated outcomes. Harm Reduct J. 2004;1(1):8.
99. Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an integrative model of change. J Consult Clin Psychol. 1983;51(3):390–5.

Publisher's Note