

Chapter 12

Homelessness and Substance Use Disorders



Gary W. Stablein, Bruce S. Hill, Samaneh Keshavarz, and Maria D. Llorente

Introduction

Among the homeless, there are high rates of substance use disorders, primarily alcohol and illicit drugs. Homeless individuals face unique challenges when engaging in treatment for substance use disorders, which likely contributes to the high rate of treatment failure observed among this population. Features of homelessness that correlate with increased rate of treatment relapse include unstable living environment and lack of social supports. For these reasons, understanding and addressing substance use disorders and homelessness can have a significant impact on the availability and delivery of care to this population and has the potential to improve outcomes.

Prevalence of Substance Use and Abuse Among Homeless

Determination of the prevalence of SUD among the homeless population is difficult and varies based on several factors, including inconsistent definitions of

G. W. Stablein

George Washington University Hospital, Department of Psychiatry, Washington, DC, USA

e-mail: gstablein@gwu.edu

B. S. Hill

Georgetown University School of Medicine, Washington DC Veterans Affairs Medical Center,

Department of Psychiatry, Washington, DC, USA

S. Keshavarz

George Washington University, School of Medicine, Washington, DC, USA

e-mail: skeshavarz@gwu.edu

M. D. Llorente (✉)

Department of Veterans Affairs, Georgetown University School of Medicine, Department of Psychiatry, Washington, DC, USA

e-mail: Maria.Llorente@va.gov

homelessness, population studied (youth v. elderly; male v. female), varied sampling strategies (structured interview v. self-report), and location of sample (telephone v. shelter v. hospital setting v. primary care clinic). However, the consistent finding is that substance abuse is more common among homeless than in those who are housed. The Substance Abuse and Mental Health Services Administration estimates that 38% of homeless people are dependent on alcohol and 26% abused other drugs [1]. Other studies have found that over a third of homeless individuals experience alcohol and drug problems [2]. In a recent survey of homeless adults aged 50 and older in California, nearly two-thirds had used at least one illicit drug in the previous 6 months and exhibited moderate severity symptoms [3]. A literature review on SUD among homeless from seven Western countries found that alcohol dependence affected 38% of the male samples (range of 9–58%) and drug dependence affected 24% of the total sample (range of 5–54%) [4].

The most common substance used by a national sample of homeless adults is tobacco. Nearly 75% smoke cigarettes [5]. This prevalence of tobacco use among homeless is four times that of the general US population. Not surprisingly, smoking-related deaths among homeless occur at twice the rate seen among housed persons and significantly contribute to the higher and younger mortality seen among the homeless [6].

Alcohol is the primary substance of abuse in nearly 49% of homeless who were admitted to a substance abuse treatment facility, followed by opioids (22%) and cocaine (14%) [7]. Crack cocaine use not only predicted greater homelessness at baseline; it also predicted greater homelessness within 6 months among those who were initially housed [8].

Of concern is the finding that over the past several decades, rates of substance abuse among homeless persons seem to be rising among both men and women, with the observed change mainly in illicit drug use [9, 10]. Further, when compared with people who are housed, those who are homeless have more severe substance use disorders [11]. An interesting finding is that substance-related presentations to an urban emergency department is highest at the beginning of the month and steadily declines thereafter [12]. This finding was stronger for patients with primary substance use disorders than for patients with other mental illness. This pattern closely corresponds to access to disposable income from federal disbursements, including social security, veterans pensions, and welfare.

Outcomes Associated with Homelessness and SUD

Substance abuse increases the risk that a person will become homeless, often through the inability to maintain professional obligations (i.e., work, school), and once that occurs, the likelihood of obtaining stable housing independently is significantly reduced. SUD disrupts relationships with social supports, including friends, family, and community members, leading to further social isolation. Additionally,

they face greater obstacles in accessing general and preventive primary care services, as well as addiction treatment and support for recovery.

Use of substances is associated with significant morbidity and mortality among homeless persons. For those who are living on the streets, intoxication poses particular safety risks due to increased vulnerability to theft, assaults, rape, and arrests [13]. SUD can lead to increased risk for contracting communicable diseases (i.e., through shared needles usage, risky sexual behavior, poor hygiene, etc.), accidental deaths (through falls with subsequent subdural hematoma, overdose), and an overall deterioration of health [14]. A study that observed physical and mental health in homeless illicit drug users in Dublin, Ireland, found that “current and previous drug users were five times more likely than non-drug users to suffer from multi-morbidity and current drug users were 4 times more likely compared to never drug users to have a lower perceived quality of life” [15].

In the USA, studies have found higher mortality risks in homeless than in the general population, often from preventable causes [16]. O’Connell reviewed data from several studies and determined that homeless have a three to four higher mortality rate than the general population. A history of alcohol use or intravenous drug use further increased the risk by an odds ratio of 1.5. Homeless persons are at particular risk for drug overdoses [17] and suicidal thinking or attempts [18]. In a recent study, homeless adults with SUD were significantly more likely than those without SUD to have suicidal ideation [19]. More than two of every five opioid overdoses among homeless were due to opioids alone [20] (Table 12.1).

Two-Way Relationship Between SUD and Homelessness

Substance use disorders are often cited as significant determinants of homelessness [21]. Addiction can lead to loss of job, disruption of social ties, and, for low-income persons, loss of housing [1]. Substances may be used to cope with problems; however, this leads to further employment instability and difficulty finding and keeping stable housing. In this model, alternatively referred to as the social selection or

Table 12.1 Substance implicated in overdose deaths in homeless adults [20]

Drug class	Number of overdoses (% of total)	% involving other/multiple drug classes	% involving alcohol intoxication	% involving other/multiple drugs or alcohol
Any drug	219 (100.0)	39.7	30.6	54.3
Opioids	177 (80.8)	44.6	29.9	57.1
Cocaine	82 (37.4)	64.6	32.9	73.2
Antidepressants	21 (9.6)	90.5	52.4	95.2
Benzodiazepines	16 (7.3)	87.5	56.3	100
Antipsychotics/neuroleptics	8 (3.7)	87.5	37.5	87.5

Reprinted with permission from Bauer et al. [20]

“drift down” hypothesis, homelessness is the result of the progressive social and economic resource losses associated with substance use disorders [22].

Alternatively, homelessness can lead to SUD. In this model, known as social adaptation or social causation, once homeless, the person may become increasingly more socially isolated and can begin to turn to a substance of abuse, such as alcohol or illicit drugs, to manage the stresses of homelessness. Some homeless individuals may use alcohol and drugs to be accepted in the homeless community [22]. As early as 1946, researchers estimated that one third of homeless people in their investigation became heavy drinkers as a consequence of homelessness and related factors [23]. In another study by the UK, 80% of respondents had initiated using at least one new substance since becoming homeless [24].

Comorbid Psychiatric Disorders in Homelessness and SUD

Psychiatric disorders commonly co-occur with substance use disorders among homeless. Homelessness is associated with more severe psychiatric symptoms and a higher number of prior admissions for mental illness [25]. Similarly, people with both SUD and mental illness have been reported to be at greater risk for homelessness due to the severity of their symptoms, denial of illness and/or need for treatment, refusal to engage in services, and use of multiple substances [26]. Regarding personality disorders, both Clusters A (paranoid, schizoid, and schizotypal) and C (avoidant, dependent, and obsessive-compulsive) are found more often among homeless [27]. Homeless persons with serious mental illness are more likely to experience violence (assault, rape, injury), exposure to the elements, and accidents and to have been exposed to trauma as children [28–31]. Post-traumatic stress disorder is thus highly prevalent among homeless, with 18–48% meeting current criteria for PTSD and between 35 and 52% meeting lifetime criteria [32]. PTSD rates are particularly high among homeless women. A recent study of 148 homeless women in 3 US cities found lifetime prevalence of PTSD to be 42.6% [33]. Nearly 75% of this sample also met criteria for at least one SUD.

Treatment Considerations

Homeless persons with SUD are very challenging to work with. Even if housed, the situation may not be stable, and they remain at high risk for a return to homelessness. Clinical understanding of the natural history of SUD has changed the way we think about treatment. The expected relapses and remissions linked to subsequent treatment episodes reframe SUD as a chronic disease better served by the Chronic Care Model (CCM) [34]. Addressing their needs consists of a multi-pronged approach, including outreach, screening, assessment, behavioral interventions, and

psychopharmacologic assistance to successfully manage acute detoxification and, in some cases, medication-assisted interventions.

The clinician often should serve in the role of reminding the patient of his/her goals and reasons for desiring sobriety and permanent housing and to consistently offer hope, when the patient has difficulty seeing it for themselves. Abstinence and sobriety are very difficult to achieve and sustain. It is often helpful to think about success in measured steps: longer periods of sobriety between relapses, shorter periods of relapse before requests for detox/assistance, and gradual acceptance of need for treatment services.

The Chronic Care Model

Treatment for SUD has adapted the Chronic Care Model [34]. CCM is a comprehensive model which uses evidence-based system changes to meet the needs of growing number of people who have a specific chronic disease. Thus the first adaptation is to view SUD as chronic diseases that would benefit from comprehensive care. CCM traditionally has six components to affect functional and clinical outcomes associated with disease management (Table 12.2).

Programs which have successfully implemented the CCM strategically used well-trained addiction clinicians and/or clinical social workers for SUD chronic care [36]. Populations in which this health systems model has been successfully implemented have included homeless veterans [37, 38] and homeless women with alcohol use disorder [39], as well as housed low-income individuals with alcohol or opioid use disorder in primary care setting [35].

Table 12.2 Chronic Care Model adapted to care for SUD

Element of the Chronic Care Model delivery	Application to delivering care for SUD
Self-management support	Is the delivery system designed to ensure the delivery of evidence-based care for SUD?
Clinical information systems	Is there expert consultation available to help clinicians adhere to evidence-based SUD treatment practices?
Element of the Chronic Care Model Delivery	Is the leadership supportive, and are resources provided to support the delivery of SUD care?
Self-management support	Is the delivery system designed to ensure the delivery of evidence-based care for SUD?
Clinical information systems	Is there expert consultation available to help clinicians adhere to evidence-based SUD treatment practices?
Community resources	Is the leadership supportive, and are resources provided to support the delivery of SUD care?

Katherine et al. [103], Table 1. © Johns Hopkins University Press. Reprinted with permission of Johns Hopkins University Press [35]

This model is successful in the treatment of SUD for several reasons. First, longitudinal care specifically addresses the chronic nature of SUD [40]. Second, integrating this multi-pronged care at primary care level addresses concerns regarding stigma and reaches out to the location where many individuals will initially present for treatment [41]. Lastly, this model has demonstrated effectiveness in sustaining recovery [42].

Outreach

Homeless persons may not be aware of the services available in the immediate area. Initial efforts at outreach should first address basic needs to better engage the patient. Information should be provided regarding how and where to obtain identification cards, local temporary shelters, food/soup kitchens, and places that are available to shower and do laundry. Additional services that may be helpful include where to access use of a computer or fax so that patients can apply for jobs, attend school and complete homework assignments, and also maintain the social contacts they may have. In addition, those persons who are disabled will also need information regarding applications for entitlements, including government assistance for income and housing subsidies.

Once basic needs are addressed and a trusting relationship has been established, information about local behavioral health and substance abuse treatment programs can be shared. One small sample of assertive outreach to homeless persons with SUD demonstrated success in 41% of the group entering treatment [43].

Screening and Assessment of SUD

Adequate assessment tools are needed to identify the needs of homeless individuals with SUD, who experience unique circumstances and are particularly vulnerable for sensory loss, comorbid medical conditions, and, in some cases, cognitive impairment [44]. Access to appropriate assessments can further the development of preventive measures and treatment practices, which can yield improved health outcomes. Assessments should be customized and constructed specifically for the homeless. For example, while there are many assessments that screen for sleep quality or nutrition in the general population, these assessments lose validity among the homeless, given that this population often does not have a bed in which to sleep or access to food preparation and storage appliances (i.e., refrigerators).

The following tools have been validated for use that takes into account the specific circumstances of homelessness:

- Addiction Severity Index (ASI) [45]
- Beck Depression Inventory (BDI II) [46]

- Brain Injury Screening Questionnaire (BISQ) [47]
- Brief Instrumental Functioning Scale [48]
- Colorado Coalition for the Homeless Consumer Outcome Scale [49]
- Delighted-Terrible Faces Scale (DTFS) [50]
- Rural Homelessness Interview Schedule [51]
- Life Fulfilment Scale (LFS) [52]
- Nottingham Health Profile [53]
- Short-Form Survey 12 (SF-12) [54] and/or Short-Form Survey 36 (SF-36) [55]
- World Health Organization Quality of Life 100 (WHOQoL 100) [56] and/or World Health Organization Quality of Life BREF (WHOQoL-BREF) [57]

Behavioral Interventions

There are a wide range of evidence-based treatments that have been studied and found to be effective in homeless with SUD. Examples include motivational interviewing, assertive community treatment, intensive case management, 12-step programs, and contingency management. Among treatment programs that offer these services, six core principles that facilitate the reduction of substance use disorders among people who are homeless have been identified and are listed in Table 12.3 [58]. (Table 12.3).

Motivational interviewing (MI) has an extensive evidence base and wide applicability [59]. This modality can be used to facilitate acceptance of substance abuse treatment, transition to permanent and supportive housing, and case management services [60]. MI typically starts with an evaluation of the addictive behavior, its consequences, and the social and personal context of use. Personalized feedback is offered and guided by reflective listening, resistance reduction, and avoidance of arguing with the client. Direct advice is offered which challenges the client's assumptions but leaves the decision and responsibility to the client. Within the adult population, brief motivational interviewing is shown to decrease alcohol use, drug use, and smoking.

Intensive case management services can address the unique and extensive needs of homeless persons. An advantage of intensive case management is that the case manager can serve to coordinate services that are often fragmented and delivered

Table 12.3 Core principles associated with reduction in substance use disorders among homeless persons

Emphasis on client choice regarding treatment decisions
Development of a positive relationship between the client and the provider
Use of assertive community treatment approaches to service delivery
Housing (especially supportive housing)
Assistance with basic instrumental needs (food, income, clothing, etc.)
Flexibility and nonrestrictive policies

through many providers and agencies. An added advantage is that the case manager can serve to navigate multiple systems of care with and for the homeless person, in a way that he/she might not be able to do for themselves.

A shelter-based assertive community treatment (ACT) intervention in which homeless persons worked with a consistent social worker and psychiatrist was more likely to enter treatment than those who received standard treatment with the available provider [61]. This intervention resulted in 51% of participants engaging with a substance abuse program versus only 13% of the standard group. A related randomized trial compared ACT (a client-provider ratio of 1:15 or 1:10) with an integrated intensive clinical case management approach (ratio of 1:25) [62]. Both interventions were equally successful with approximately 1/3 of participants in each group achieving remission.

Group-based interventions demonstrate high levels of success in this population. A recent randomized clinical trial examined alcohol use among young homeless adults [63]. The treatment intervention used group processes including facilitator behavior, participant change talk (CT), and sustain talk (ST). Participants were followed for 3 months. Group CT was associated with decreased likelihood of being a heavy drinker at the 3-month follow-up. Peer groups and consumer-run drop-in centers are also valuable resources for people who are homeless, particularly if those centers also provide core services, such as shower and laundry facilities, and access to computers and telephones [64].

Alcoholics Anonymous (AA) is an effective group intervention for homeless persons with SUD due to affordability, non-intrusiveness, and ease of attendance. Additional benefits include the mentorship and fellowship seen which creates a socially supportive, non-judgmental environment [65]. The phases of Alcoholics Anonymous participation and recovery have been described as follows: “hitting bottom, first stepping, making a commitment, accepting your problem, telling your story, and doing twelfth step work” [66]. Narcotics Anonymous has adapted the AA model but replaces “alcohol” with addiction and serves to assist anyone who wishes to obtain sobriety from any substance of abuse [67].

AA and NA, however, may not be helpful for all homeless persons and, often, are utilized after an individual has secured housing. AA and NA emphasize prioritizing recovery and sobriety above everything else. However, when an individual has very basic unmet needs, such as securing shelter or food, these become the priorities [66]. Additionally, chronically homeless persons with SUD are at high risk for remaining homeless, and thus delays in being able to find and maintain quality housing [68]. Studies suggest that having economic and housing stability is almost a requirement to maintaining sobriety [69]. This in part has led to the evidence-based model of Housing First, in which abstinence is not a requirement for program entry [70]. In fact, one study found an 80% housing retention rate among persons who were chronically homeless, with SUD and a co-occurring mental health diagnosis when a Housing First approach was used [71].

Faith-based services are also available to address the needs of homeless persons with SUD. One study found that participation in religious-oriented programs did not significantly change the individual's level of religiosity or religious participation

[72]. However, greater religious participation was associated with positive outcomes in housing, mental health, substance use, and overall quality of life.

Contingency management programs utilize behavioral psychology principles. Clients earn vouchers or obtain prizes or privileges as they achieve sobriety and maintain abstinence or achieve other behavioral change goals [73]. This type of a program has consistently shown higher rates of abstinence among homeless persons with cocaine use disorders [74] and reductions in risky behaviors, including quantity of substance use [75].

Medications for Substance Use Disorders

Access to medication-assisted treatments and adherence is very difficult for homeless individuals. The barriers include understanding medication instructions, keeping to a schedule, and being able to afford and store medication [76]. In addition, some persons are reluctant to take medications that may cause sedation as they have a need to be alert to potential assaults. As a result, studies have found that being homeless was associated with the lowest rates of medication adherence [77]. This may also play a role in the high use of hospital services.

Homeless persons with substance use disorders are at high risk for overdoses and related mortality [78]. A recent study found that half of opioid misusers had personally experienced an overdose and most of the sample had witnessed someone else's overdose [79]. Given the current epidemic of opioid overdose deaths, there is an urgent need for more widespread access to naloxone.

Naloxone is a short-acting prescription opioid antagonist, which actively displaces heroin and other opioid drugs from the mu opioid receptor. It rapidly reverses the effects of opioids and, in the event of overdose, is lifesaving, with rapid return of consciousness and independent breathing. Clinically, this is true whether the overdose is of an illicit drug, such as heroin, or a prescription opioid medication, obtained via prescription or diversion. Emergency naloxone kits, known as "take-home naloxone," are available in the USA, and although available in injectable and nasal spray forms, the nasal spray is more cost effective (approximately \$30 for a twin pack) [80]. These kits can now be prescribed as part of the comprehensive care of persons who have opioid use disorders.

Studies have found that lay public friends and family members are highly willing to provide emergency care while waiting for traditional first responders to arrive [81]. Since 2017, 49 states and the District of Columbia legally allow pharmacists to dispense naloxone [82]. Naloxone should be prescribed to any person who is using heroin or other opioid products and instructed in its use [83]. These take-home kits have significantly increased naloxone availability [84].

Education should also be provided to the person's identified social contacts, friends, and/or family members in order to improve the likelihood that naloxone will be used and effective. Further, use of naloxone has been implemented in homeless health clinics and shelters [85, 86].

Office-based buprenorphine treatment for opioid disorders has been found to be as effective for homeless persons as it is for housed persons, but they required more clinical support during the initial month of treatment [87].

Settings of Care

Homeless persons use emergency department services much more frequently than do people who are housed for several reasons [88]. Homeless persons may have more severe disease, lack access to other forms of care, and often have medical comorbidities that may require evaluation and treatment. One model to evaluate and treat these persons while reducing the need for psychiatric hospitalization is the use of Mobile Crisis Teams [89]. People who are homeless also are more likely to be admitted for substance-related disorders than those who are housed [90]. They have longer lengths of stay once admitted, higher costs associated with the admission, and higher readmission rates [91, 92]. They also are more likely to enter a detoxification program [93]. However, detoxification alone is often ineffective with relapse rates varying by substance of abuse but range 60% for alcohol [94], 60–80% for cocaine [95], and 65–80% for opioid dependence [96].

For these reasons, adequate discharge planning is critical. Short-term (2–6 weeks) transition residential programs, when available, have been associated with significantly lower relapse rates [97]. Residential treatment can also improve social skills and enhance a sense of community and social connectedness. These programs can successfully reduce depressive symptoms, as well increase the person's ability to tolerate distress. The ability to tolerate distress has been associated with better outcomes among individuals with addictive behaviors [98].

Making housing contingent upon substance abstinence produces higher rates of drug abstinence than non-contingent housing [74, 99]. Recent studies have added reinforcement-based treatment (RBT) to abstinence contingency housing [100]. RBT is an intensive day treatment program which consists of cognitive behavioral group therapy, abstinence-contingent recreational activities, vocational assistance, individual counseling, and housing support. The addition of RBT further improves treatment outcomes [101, 102].

Conclusion

Working with homeless individuals who also have substance use disorders is challenging. Based on available data, the most effective models of care address basic core needs first, particularly secure housing. The management of substance use disorders is best understood through the chronic care model of illness. Establishing trust with a consistent treatment team is needed, and through the use of motivational interviewing and other behavioral strategies, the person will not only be more likely

to engage in substance abuse services but also more likely to sustain sobriety and recovery. Encouragement of participation in 12-step programs and faith-based groups will further a sense of community and facilitate the establishment of new social supports. When the person has co-occurring psychiatric and medical conditions, additional resources that can evaluate and treat acute conditions and offer preventive services will need to be coordinated. Because of the magnitude and complexity of services that are needed, the ideal mechanism is to provide a “one-stop shop,” in which all of these services are offered in a single location. Clinical, social, and core services could be offered, as discussed below.

The clinical services should offer primary care, mental health, and substance use services at the same location. The substance use services would ideally include peer support counseling, group, and 12-step options, preferably with contingency and/or reinforcement approaches. Naloxone should be offered as part of comprehensive treatment to any person at risk for opioid overdose.

The social services would facilitate education regarding criteria for various government aid programs, including housing options (transitional, residential programming, subsidized, etc.), how to obtain needed documents (birth certificate, DD-214 for veterans, identification card, etc.), and how to apply for those programs. The social services would also include information regarding educational and vocational programs and, if the person is disabled, application for disability programs.

Core services would include space for showers, laundry facilities, computers, fax machine and telephone access, non-denominational chapel or meditation room, and emergency food pantry. Through this “one-stop shop” model, care is delivered in a patient-centered and coordinated fashion, which ultimately provides improved outcomes for the patient and less cost for society as a whole.

References

1. National Coalition for the Homeless. Substance abuse and homelessness. 2017. Available at www.nationalhomeless.org. Accessed 19 Nov 2019.
2. Gillis L, Dickerson G, Hanson J. Recovery and homeless services: New directions for the field. *Open Health Services Policy J*. 2010;3:71–9.
3. Spinelli MA, Ponath C, Tieu L, Hurstak EE, Guzman D, Kushel M. Factors associated with substance use in older homeless adults: Results from the HOPE HOME study. *Subst Abus*. 2017;38(1):88–94.
4. Fazel S, Khosla V, Doll H, Geddes J. The prevalence of mental disorders among the homeless in Western countries: Systematic review and meta-regression analysis. *PLoS Med*. 2008;5:e225.
5. Baggett TP, Rigotti NA. Cigarette smoking and advice to quit in a national sample of homeless adults. *Am J Prev Med*. 2010;39:164–72.
6. Hwang SW, Wilkins R, Tjepkema M, O’Campo PJ, Dunn JR. Mortality among residents of shelters, rooming houses, and hotels in Canada: 11 year follow-up study. *BMJ*. 2009;339:b4036.
7. Substance Abuse and Mental Health Services Administration. Addressing viral hepatitis in people with substance use disorders. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2011. (Treatment Improvement Protocol (TIP) Series 53). HHS Publication No. (SMA) 11–4656.

8. Orwin RG, Scott CK, Arieira C. Transitions through homelessness and factors that predict them: Three-year treatment outcomes. *J Subst Abuse Treat.* 2005;28:S23–39.
9. North CS, Eyrych KM, Pollio DE, Foster DA, Cottler LB, Spitznagel EL. The Homeless Supplement to the Diagnostic Interview Schedule: Test–retest analyses. *Int J Methods Psychiatr Res.* 2004;13:184–91.
10. O’Toole TP, Conde-Martel A, Gibbon JL, Hanusa BH, Freyder PJ, Fine MJ. Substance-abusing urban homeless in the late 1990s: How do they differ from non-substance-abusing homeless persons? *J Urban Health.* 2004;81:606–17.
11. Buchholz JR, Malte CA, Calsyn DA, Baer JS, Nichol P, Kivlahan DR, et al. Associations of housing status with substance abuse treatment and service use outcomes among veterans. *Psychiatr Serv.* 2010;61:698–706.
12. Halpern SD, Mechem CC. Declining rate of substance abuse throughout the month. *Am J Med.* 2001;110(5):347–51.
13. Greenberg GA, Rosenheck RA. Jail Incarceration, Homelessness and mental Health: A National Study. *Psychiatr Serv.* 2008;59(2):170–7.
14. Homeless Hub. Substance use & addiction. 2019. Available at: www.homelesshub.ca/about-homelessness/topics/substance-use-addiction. Accessed 19 Nov 2019.
15. O’Brien KK, Schuttke A, Alhakeem A, Donnelly-Swift E, Keogh C, O’Carroll A, et al. Health, perceived quality of life and health services use among homeless illicit drug users. *Drug Alcohol Depend.* 2015;154:139–45.
16. O’Connell JJ. Premature mortality in homeless populations: A review of the literature. National Healthcare for the Homeless Council: Nashville; 2005.
17. Seal KH, Kral AH, Gee L, Moore LD, Bluthenthal RN, Lorvick J, et al. Predictors and prevention of nonfatal overdose among street-recruited injection heroin users in the San Francisco Bay Area, 1998–1999. *Am J Public Health.* 2001;91:1842–6.
18. Rosenheck R, Kaspro W, Frisman L, Liu-Mares W. Cost-effectiveness of supported housing for homeless persons with mental illness. *Arch Gen Psychiatry.* 2003;60:940–51.
19. Lee KH, Jun JS, Kim YJ, Roh S, Moon SS, Bukonda N, Hines L. Mental Health, Substance Abuse, and Suicide Among Homeless Adults. *J Evid Inf Soc Work.* 2017;14(4):229–42.
20. Bauer LK, Brody JK, León C, Health B, Baggett TP. Characteristics of Homeless Adults Who Died of Drug Overdose: A Retrospective Record Review HHS Public Access. *J Heal Care Poor Underserved.* 2016;27(2):846–59.
21. Glasser I, Zywiak WH. Homelessness and substance misuse: a tale of two cities. *Subst Use Misuse.* 2003;38(3–6):551–76.
22. Johnson TP, Freels SA, Parsons JA, et al. Substance abuse and homelessness: Social selection or social adaptation? *Addiction.* 1997;92(4):437–45.
23. Didenko E, Pankratz N. Substance use: pathways to homelessness? or a way of adapting to street life? Substance use: pathways to homelessness? or a way of adapting to street life? I here to help. 2007. Available at <http://www.heretohelp.bc.ca/visions/housing-and-homelessness-vol4/substance-usepathways-homelessness>.) Accessed 29 Nov 2019.
24. Fountain J, Howes S, Marsden J, et al. Drug and alcohol use and the link with homelessness: Results from a survey of homeless people in London. *Addiction Res Theory.* 2003;11(4):245–56.
25. Eyrych-Garg KM, Cacciola JS, Carise D, Lynch KG, McLellan AT. Individual characteristics of the literally homeless, marginally housed, and impoverished in a US substance abuse treatment-seeking sample. *Soc Psychiatry Psychiatr Epidemiol.* 2008;43:831–42.
26. Center for Mental Health Services. Blueprint for change: Ending chronic homelessness for persons with serious mental illnesses and co-occurring substance use disorders. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2003. HHS Publication No. (SMA) 04-3870.
27. Ball SA, Cobb-Richardson P, Connolly AJ, Bujosa CT, O’Neill TW. Substance abuse and personality disorders in homeless drop-in center clients: Symptom severity and psychotherapy retention in a randomized clinical trial. *Compr Psychiatry.* 2005;46:371–9.

28. Wan JJ, Morabito DJ, Khaw L, Knudson MM, Dicker RA. Mental illness as an independent risk factor for unintentional injury and injury recidivism. *J Trauma*. 2006;61:1299–304.
29. Frencher SK Jr, Benedicto CM, Kendig TD, Herman D, Barlow B, Pressley JC. A comparative analysis of serious injury and illness among homeless and housed low income residents of New York City. *J Trauma*. 2010;69:S191–9.
30. Tam TW, Zlotnick C, Robertson MJ. Longitudinal perspective: Adverse childhood events, substance use, and labor force participation among homeless adults. *Am J Drug Alcohol Abuse*. 2003;29:829–46.
31. Maniglio R. Severe mental illness and criminal victimization: A systematic review. *Acta Psychiatr Scand*. 2009;119:180–91.
32. Kulka RA. Considerations in estimating the prevalence of PTSD in Populations not typically covered in household surveys. National Academy of Sciences, Engineering and Medicine. 2016. Available at: https://sites.nationalacademies.org/cs/groups/dbasssite/documents/web-page/dbasse_173482.pdf. Accessed 28 Nov 2019.
33. Whitbeck LB, Armenta BE, Gentzler KC. Homelessness-related traumatic events and PTSD among women experiencing episodes of homelessness in three US cities. *J Trauma Stress*. 2015;28(4):355–60.
34. Tai B, Volkow ND. Treatment for substance use disorder: opportunities and challenges under the affordable care act. *Soc Work Public Health*. 2013;28(3–4):165–74.
35. Watkins KE, Ober AJ, Lamp K, Lind M, Setodji C, Osilla KC, et al. Collaborative care for opioid and alcohol use disorders in primary care: The SUMMIT Randomized Clinical Trial. *JAMA Int Med*. 2017;177(10):1480–8. <https://doi.org/10.1001/jamainternmed.2017.3947>.
36. Dennis ML, Scott CK, Dennis M. Four-year outcomes from the Early Re-Intervention (ERI) experiment using Recovery Management Checkups (RMC). *Drug Alcohol Depend*. 2012;121(2):10–7.
37. O’Toole TP, Buckel L, Bourgault C, Blumen J, Redihan SG, Jiang L, et al. Applying the chronic care model to homeless veterans: effect of a population approach to primary care on utilization and clinical outcomes. *Am J Public Health*. 2010;100(12):2493–9.
38. Smelson DA, Kline A, Kuhn J, Rodrigues S, O’Connor K, Fisher W, et al. A Wraparound treatment engagement intervention for homeless veterans with co-occurring disorders. *Psychol Serv*. 2013;10(2):161–7.
39. Upshur C, Weinreb L, Bharel M, Reed G, Frisard C. A randomized control trial of a chronic care intervention for homeless women with alcohol use problems. *J Subst Abuse Treat*. 2015;51:19–29.
40. McClellan C, Lambdin BH, Ali MM, Mutter R, Davis CS, Wheeler E, et al. Opioid-overdose laws association with opioid use and overdose mortality. *Addict Behav*. 2018;86:90–5.
41. Blue Shield of California Foundation. Exploring low-income Californians’ needs and preferences for behavioral health care. 2015;(March). Available from: https://blueshieldcafoundation.org/sites/default/files/covers/Behavioral Health Langer Report_2015.pdf.
42. Scott CK, Dennis ML, Laudet A, Funk RR, Simeone RS. Surviving drug addiction: the effect of treatment and abstinence on mortality. *Am J Public Health*. 2011;101:737–44.
43. Fisk D, Rakkfeldt J, McCormack E. Assertive outreach: An effective strategy for engaging homeless persons with substance use disorders into treatment. *Am J Drug Alcohol Abuse*. 2006;32:479–86.
44. Gordon SJ, Grimmer K, Bradley A, Direen T, Baker N, Marin T, et al. Health assessments and screening tools for adults experiencing homelessness: a systematic review. *BMC Public Health*. 2019;19(1):994.
45. McLellan AT, Luborsky L, O’Brien CP, Woody GE. An improved diagnostic instrument for substance abuse patients: The Addiction Severity Index. *J Nerv Ment Dis*. 1980;168:26–33.
46. Beck AT, Steer RA, Brown GK. Manual for the Beck Depression Inventory-II. San Antonio, TX: Psychological Corporation; 1996.
47. Brain Injury Screening Questionnaire. (1998). New York: Research and Training Center on Community Integration, Mount Sinai School of Medicine.

48. Sullivan G, Dumenci L, Burnam A, Koegel P. Validation of the brief instrumental functioning scale in a homeless population. *Psychiatr Serv*. 2001;52(8):1097–9.
49. Cook PF, Farrell E, Perlman J. The CCH Consumer Outcome Scales: A Brief Instrument to Assess the Multiple Problems of Homelessness. *J Nurs Meas*. 2007;15(2):83–104.
50. Andrews FM, Crandall R. The validity of measures of self-reported well-being. *Soc Indic Res*. 1976;3(1):1–19.
51. Craft-Rosenberg M, Powell SR, Culp K. Iowa Homeless Research Team. Health status and resources of rural homeless women and children. *West J Nurs Res*. 2000;22(8):863–78.
52. Baker GA, Jacoby A, Smith DF, Dewey ME, Chadwick DW. Development of a Novel Scale to Assess Life Fulfilment as Part of the Further Refinement of a Quality-of-Life Model for Epilepsy. *Epilepsia*. 1994;35(3):591–6.
53. Hunt SM. The Nottingham health profile: user's manual. *Measuring Health Status*. 1986.
54. Ware JE Jr, Kosinski M, Keller SD. A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Med Care*. 1996;34(3):220–33.
55. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care*. 1992;30(6):473–83.
56. WHOQOL Group. Study protocol for the World Health Organization project to develop a Quality of Life assessment instrument (WHOQOL). *Qual Life Res*. 1993;2(2):153–9.
57. Skevington SM, Lotfy M, O'Connell KA, WHOQOL Group. *Qual Life Res*. 2004;13(2):299–310.
58. O'Campo P, Kirst M, Schaefer-McDaniel N, Firestone M, Scott A, McShane K. Community-based services for homeless adults experiencing concurrent mental health and substance use disorders: A realist approach to synthesizing evidence. *J Urban Health*. 2009;86:965–89.
59. Center for Substance Abuse Treatment. *Enhancing motivation for change in substance abuse treatment*. Rockville, MD: Substance Abuse and Mental Health Services Administration; 1999. (Treatment Improvement Protocol (TIP) Series 35). HHS Publication No. (SMA) 99-3354.
60. Fisk D, Sells D, Rowe M. Sober housing and motivational interviewing: The Treatment Access Project. *J Prim Prev*. 2007;28:281–93.
61. Bradford DW, Gaynes BN, Kim MM, Kaufman JS, Weinberger M. Can shelter-based interventions improve treatment engagement in homeless individuals with psychiatric and/or substance misuse disorders? A randomized controlled trial. *Med Care*. 2005;43:763–8.
62. Essock SM, Mueser KT, Drake RE, Covell NH, McHugo GJ, Frisman LK, et al. Comparison of ACT and standard case management for delivering integrated treatment for co-occurring disorders. *Psychiatr Serv*. 2006;57:185–96.
63. D'Amico EJ, Houck JM, Hunter SB, Miles JN, Osilla KC, Ewing BA. Group motivational interviewing for adolescents: Change talk and alcohol and marijuana outcomes. *J Consult Clin Psychol*. 2015;83(1):68–80.
64. Brown LD, Wituk S, Meissen G. *Mental health self-help: Consumer and family initiatives*. New York: Springer Science + Business Media; 2010. *Consumer-run drop-in centers: Current State and Future Directions*; pp. 155–167.
65. Alcoholics Anonymous. *The big book*. Available at http://www.12steps.nz/12-step-programs/alcoholics-anonymous/the-big-book/#Low_Bottom_Alcoholic_Recovery_Stories. Accessed 2 Jan 2020.
66. Rayburn R, Wright JD. Homeless men in alcoholics anonymous: barriers to achieving and maintaining sobriety. *J Appl Soc Sci*. 2009;3(1):55–70.
67. Fellowship of Narcotics Anonymous. *Narcotics Anonymous: 6th edition Basic Text*. NA World Services Inc. 2008.
68. Booth BM, Sullivan G, Koegel P, Burnam A. Vulnerability factors for homelessness associated with substance dependence in a community sample of homeless adults. *Am J Drug Alcohol Abuse*. 2002;28(3):429–52.
69. Stark L. A century of alcohol and homelessness: Demographics and stereotypes. *Alcohol Res Health*. 1987;11(3):8.

70. Watson DP, Shuman V, Kowalsky J, et al. Housing First and harm reduction: a rapid review and document analysis of the US and Canadian open-access literature. *Harm Reduct J*. 2017;14:30.
71. Tsemberis S, Gulcur L, Nakae M. Housing first, consumer choice, and harm reduction for homeless individuals with a dual diagnosis. *Am J Public Health*. 2004;94(4):651–6.
72. Tsai J, Rosenheck RA, KasproW WJ, McGuire JF. Do faith-based residential care services affect the religious faith and clinical outcomes of homeless veterans? *Comm MH J*. 2012;48(6):682–91.
73. Center for Substance Abuse Treatment (US). Behavioral health services for people who are homeless. Rockville (MD): Substance Abuse and Mental Health Services Administration (US); 2013. (Treatment Improvement Protocol (TIP) Series, No. 55.) A Review of the Literature. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK138716>. Accessed November 29, 2019.
74. Schumacher JE, Milby JB, Wallace D, Meehan DC, Kertesz S, Vuchinich R, et al. Meta-analysis of day treatment and contingency-management dismantling research: Birmingham Homeless Cocaine Studies (1990–2006). *J Consult Clin Psychol*. 2007;75:823–8.
75. 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;39:255–63.
76. Morrison S. Self management support helping clients set goals to improve their health. National Health Care for the Homeless Council: Nashville; 2007.
77. Gilmer TP, Dolder CR, Lacro JP, Folsom DP, Lindamer L, Garcia P, et al. Adherence to treatment with antipsychotic medication and health care costs among Medicaid beneficiaries with schizophrenia. *Am J Psychiatry*. 2004;161:692–9.
78. Baggett TP, Hwang SW, O’Connell JJ, Porneala BC, Stringfellow EJ, Orav EJ, et al. Mortality among homeless adults in Boston: Shifts in causes of death over a 15-year period. *JAMA Intern Med*. 2013;173(3):189–95.
79. Strang J. Death matters: understanding heroin/opiate overdose risk and testing potential to prevent deaths. *Addiction*. 2015;110(Suppl 2):27–35.
80. FDA moves quickly to approve easy-to-use nasal spray to treat opioid overdose. 2015. <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm473505.htm>. Accessed 30 Nov 2019.
81. Strang J, Manning V, Mayet S, Titherington E, Offor L, Semmler C, et al. Family carers and the prevention of heroin overdose deaths: unmet training need and overlooked intervention opportunity of resuscitation training and supply of naloxone. *Drugs Educ Prev Policy*. 2008;15(2):211–8.
82. Davis C, Carr D. State legal innovations to encourage naloxone dispensing. *J Am Pharm Assoc*. 2017;57(Supplement):S180–4.
83. Strang J, McDonald R, Campbell G, Degenhardt L, Nielsen S, Ritter A, Dale O. Take-home naloxone for the emergency interim management of opioid overdose: the public health application of an emergency medicine. *Drugs*. 2019;79(13):1395–418.
84. Sohn M, Talbert JC, Huang Z, Lofwall MR, Freeman PR. Association of naloxone coprescription laws with naloxone prescription dispensing in the United States. *JAMA Netw Open*. 2019;21:2(6).
85. Pietrusza LM, Puskar KR, Ren D, Mitchell AM. Evaluation of an Opiate Overdose Educational Intervention and Naloxone Prescribing Program in Homeless Adults Who Use Opiates. *J Addict Nurs*. 2018;29(3):188–95.
86. Wallace B, Barber K, Pauly B (Bernie). Sheltering risks: Implementation of harm reduction in homeless shelters during an overdose emergency. *Int J Drug Policy*. 2018;53:83–9.
87. Alford DP, LaBelle CT, Richardson JM, O’Connell JJ, Hohl CA, Cheng DM, et al. Treating homeless opioid dependent patients with buprenorphine in an office-based setting. *J Gen Intern Med*. 2007;22:171–6.

88. Pasic J, Russo J, Roy-Byrne P. High utilizers of psychiatric emergency services. *Psychiatr Serv.* 2005;56:678–84.
89. Ng AT. Mobile crisis teams. In: Gillig PM, McQuiston HL, editors. *Clinical guide to the treatment of the mentally ill homeless person.* Arlington: American Psychiatric Publishing; 2006. p. 73–82.
90. Salit SA, Kuhn EM, Hartz AJ, Vu JM, Mosso AL. Hospitalization costs associated with homelessness in New York City. *N Engl J Med.* 1998;338:1734–40.
91. Hwang SW, Weaver J, Aubry T, Hoch JS. Hospital costs and length of stay among homeless patients admitted to medical, surgical, and psychiatric services. *Med Care.* 2011;49:350–4.
92. Irmiter C, McCarthy JF, Barry KL, Soliman S, Blow FC. Reinstitutionalization following psychiatric discharge among VA patients with serious mental illness: A national longitudinal study. *Psychiatric Q.* 2007;78:279–86.
93. US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Treatment Episode Data Set—Admissions (TEDS-A), 2009. 2011.* Inter-university Consortium for Political and Social Research (ICPSR).
94. Moos RH, Moos BS. Rates and predictors of relapse after natural and treated remission from alcohol use disorders. *Addiction.* 2006;101(2):212–22.
95. Paliwal P, Hyman SM, Sinha R. Craving predicts time to cocaine relapse: further validation of the Now and Brief versions of the cocaine craving questionnaire. *Drug Alcohol Depend.* 2008;93(3):252–9.
96. Chutuape MA, Jasinski DR, Fingerhood MI, Stitzer ML. One-, three-, and six-month outcomes after brief inpatient opioid detoxification. *Am J Drug Alcohol Abuse.* 2001;27(1):19–44.
97. Kertesz SG, Horton NJ, Friedmann PD, Saitz R, Samet JH. Slowing the revolving door: Stabilization programs reduce homeless persons' substance use after detoxification. *J Subst Abuse Treat.* 2003;24:197–207.
98. Moore JT, Skinner MA. Treatment mechanisms with homeless veterans. *J Dual Diagn.* 2017;13(4):291–7.
99. Tuten M, DeFulio A, Jones HE, Stitzer M. Abstinence-contingent recovery housing and reinforcement-based treatment following opioid detoxification. *Addiction.* 2012;107(5):973–82.
100. Roozen HG, Boulogne JJ, van Tulder MW, van den Brink W, De Jong CA, Kerkhof AJ. A systematic review of the effectiveness of the community reinforcement approach in alcohol, cocaine and opioid addiction. *Drug Alcohol Depend.* 2004;74(1):1–13.
101. Jason LA, Olson BD, Ferrari JR, Lo Sasso AT. Communal housing settings enhance substance abuse recovery. *Am J Public Health.* 2006;96(10):1727–9.
102. Tuten M, Shadur JM, Stitzer M, Jones HE. A comparison of Reinforcement Based Treatment (RBH) versus RBT plus Recovery Housing (RBTRH). *J Subst Abuse Treat.* 2017;72:48–55.
103. Watkins KE, Ober AJ, Lamp K, Lind M, Diamant A, Osilla KC, Heinzerling K, Hunter SB, Pincus HA. Implementing the chronic care model for opioid and alcohol use disorders in primary care. *Prog Community Health Partnersh.* 2017;11(4):399.