Factors Associated With Housing Stability and Criminal Convictions Among People Experiencing Homelessness and Serious Mental Illness: Results From a Housing First Study

by

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The author, whose name appears on the title page of this work, has obtained, for the research described in this work, either:

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Abstract

Background: Housing First (HF) facilitates immediate access to independent housing with community-based supports for people experiencing homelessness and serious mental illness (PEHSMI). Despite positive outcomes associated with HF, studies have infrequently investigated factors that are associated with adverse outcomes once in HF. This thesis investigates factors which hinder housing stability following randomization to HF and factors associated with criminal convictions prior to and following randomization to HF. **Methods:** Three investigations were conducted using data from the Vancouver At Home study, which contains two randomized controlled trials each involving randomization to HF vs. treatment as usual (TAU) among PEHSMI. Using self-reported data, the first investigation examined the effect of experiencing homelessness in childhood or youth on housing stability (≥90% of days stably housed) after receiving HF (TAU excluded). The second investigation retrospectively examined factors associated with criminal convictions during the five-year period preceding baseline. The third investigation examined factors associated with criminal convictions after receiving HF (TAU excluded). Provincial administrative data were combined with self-reported baseline data for the second and third investigations. **Results:** 1) Among participants randomized to HF (n=297), those who had experienced homelessness in childhood or youth had significantly lower odds of housing stability. 2) Prior to study baseline, seven variables were significantly associated with criminal convictions among participants (n=425), such as drug dependence, psychiatric hospitalization, and irregular frequency of social assistance payments (vs. regular). 3) Following receipt of HF (n=255), five variables were significantly associated with criminal convictions, including daily drug use, daily alcohol use, and having received addictions counselling among others. **Conclusions:** Results underscore social marginalization as contributing to poorer housing stability in HF and criminal convictions while in HF and prior to enrollment among PEHSMI. Further supports are needed to facilitate improvements for a greater proportion of HF clients. HF providers may be able to identify clients with additional support needs related to housing stability and criminal convictions by asking about the factors found to be significant in analyses.

Dedication

Dear Maman and Baba, you selflessly gave me everything. I am eternally indebted to you both.

Acknowledgements

Table of Contents

List of Tables

List of Figures

List of Acronyms

ACT	Assertive Community Treatment
aOR	Adjusted Odds Ratio
BC	British Columbia
CI	Confidence Interval
CJSI	Criminal Justice System Involvement
CONG	Congregate Housing First With On-Site Support
GEE	Generalized Estimating Equations
HF	Housing First
HF-ACT	Housing First With Assertive Community Treatment
HF-ICM	Housing First With Intensive Case Management
ICD-9	The International Classification of Diseases, Ninth Revision
ICD-10-CA	The International Classification of Diseases, Tenth Revision, Canada
ICM	Intensive Case Management
IMRI	Inter-Ministry Research Initiative
IQR	Interquartile Range
LASSO	Least Absolute Shrinkage and Selection Operator
MCAS	Multnomah Community Ability Scale
MINI	Mini-International Neuropsychiatric Interview
MSP	Medical Services Plan
NBR	Negative Binomial Regression
NSMD	Non-Substance Use-Related
OR	Odds Ratio
PEHSMI	People Experiencing Homelessness and Serious Mental Illness
PESMI	People Experiencing Serious Mental Illness
PRM	Psychosocial Rehabilitation Model
RR	Rate Ratio
SD	Standard Deviation
SRO	Single-Room Occupancy Hotel
TAU	Treatment As Usual
uOR	Unadjusted Odds Ratio
VAH	Vancouver At Home

Preface

In writing this thesis, formatting guidelines pertaining to the manuscript-based model of the Faculty of Health Sciences at Simon Fraser University were followed. As of the writing of this section, a manuscript based on Chapter 2 was published in the peer-reviewed journal called BMC Psychiatry. Two other manuscripts based on Chapters 3 and 4 are under review in the peer-reviewed journals called Scientific Reports and the International Journal of Drug Policy, respectively. The studies that chapters 2-4 are based on were granted ethics approval by the Research Ethics Board of Simon Fraser University. Milad Parpouchi contributed to study conception and design, data collection, data analysis and interpretation, development of hypotheses, and wrote the manuscripts/chapters. Co-authors of each of the three manuscripts published or under consideration at peer-reviewed journals are as follows:

Manuscript based on Chapter 2

- Parpouchi, M., Moniruzzaman, A., & Somers, J. M. (2021). The association between experiencing homelessness in childhood or youth and adult housing stability in Housing First. *BMC Psychiatry*, *21*, 138. https://doi.org/10.1186/s12888-021-03142-0

Manuscript based on Chapter 3

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Manuscript based on Chapter 4

- Parpouchi, M., Moniruzzaman, A., Buxton J. A., & Somers, J.M. (Under review). Substance use-related correlates of criminal convictions among adults experiencing homelessness and serious mental illness after receiving Housing First. *International Journal of Drug Policy*.

Chapter 1.

Introduction

1.1. Homelessness defined

Housing is a basic human right supported by Article 25 of the Universal Declaration of Human Rights, stating that "everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing…" (United Nations, 1948, Article 25). However, despite housing as an internationally recognized fundamental right, homelessness continues to persist as a global public health crisis. It has been estimated that 100 million people around the globe are affected by homelessness (United Nations, 2005). In North America, the situation is also dire; about 235,000 people experience homelessness annually in Canada (Gaetz et al., 2016). In the U.S., about 553,000 people were found to be experiencing homelessness in a point-in-time count in 2018 (Henry et al., 2018).

Although homelessness has formally been defined in different ways across Canada and internationally (Canadian Observatory on Homelessness, 2012b; Fazel et al., 2014), the Canadian Observatory on Homelessness has proposed a definition taking into consideration some of the previous ones and in consultation with various stakeholders across Canada (Canadian Observatory on Homelessness, 2012c). Homelessness was defined as:

> …the situation of an individual, family or community without stable, permanent, appropriate housing, or the immediate prospect, means and ability of acquiring it. It is the result of systemic or societal barriers, a lack of affordable and appropriate housing, the individual/household's financial, mental, cognitive, behavioural or physical challenges, and/or racism and discrimination. Most people do not choose to be homeless, and the experience is generally negative, unpleasant, unhealthy, unsafe, stressful and distressing. (Canadian Observatory on Homelessness, 2012a, p. 1)

A few types of homelessness were also outlined by the Canadian Observatory on Homelessness (2012a), including those who are "unsheltered" (para. 2), "emergency sheltered" (para. 2), "provisionally accommodated" (para. 2), or "at risk of homelessness" (para. 2). Unsheltered homelessness describes people without housing nor emergency homeless shelter, residing in areas not intended as a residential setting for humans (e.g., parks, cars, and abandoned buildings). Emergency sheltered homelessness describes people currently in emergency housing (e.g., homeless shelters) without means to obtain stable housing. Provisionally accommodated homelessness describes people in housing that is intended as time-limited (e.g., motels, living with friends, and living in an institution without permanent housing following discharge). At-risk of homelessness describes people with housing that is at risk of being lost due to external factors (e.g., personal crises, poverty, and discrimination).

A limitation of the word "homelessness" is that it does not describe the heterogeneity of experiences of, pathways to, and needs related to homelessness for different subpopulations (Gaetz et al., 2016). Hence, population-specific definitions have also been developed over time. Two examples include Indigenous homelessness (Thistle, 2017) and youth homelessness (Canadian Observatory on Homelessness, 2016). Thistle (2017) has defined Indigenous homelessness in Canada as:

> …a human condition that describes First Nations, Métis and Inuit individuals, families or communities lacking stable, permanent, appropriate housing, or the immediate prospect, means or ability to acquire such housing. Unlike the common colonialist definition of homelessness, Indigenous homelessness is not defined as lacking a structure of habitation; rather, it is more fully described and understood through a composite lens of Indigenous worldviews. These include: individuals, families and communities isolated from their relationships to land, water, place, family, kin, each other, animals, cultures, languages and identities. Importantly, Indigenous people experiencing these kinds of homelessness cannot culturally, spiritually, emotionally or physically reconnect with their Indigeneity or lost relationships. (p. 6)

Central to understanding what has increased the vulnerability to homelessness among Indigenous people, and consistent with the definition above, is the history and legacy of colonization, which, as the Truth and Reconciliation Commission of Canada

(2015) has stated, includes cultural genocide. As Gaetz et al. (2016) argue, "Indigenous Peoples' experiences of poverty and homelessness are firmly rooted in colonial practices and systemic discrimination" (p. 50). This history includes the dispossession of lands and coercive policies of assimilation, including, but not limited to the residential school system and the systematic separation of children from their families through the child welfare system (Anderson & Collins, 2014). These policies have resulted in intergenerational trauma, violence, and substance use, all of which have been recognized by some Indigenous people as having contributed to their homelessness (Anderson & Collins, 2014). Today, over half (52.2%) of children in foster care in Canada are Indigenous, which is close to seven times higher than the proportion of all children who are Indigenous in Canada (7.7%; Government of Canada, 2018). Additionally, it has been estimated that Indigenous people have an eight-fold higher chance of homelessness compared to the general population in Canadian urban areas (Belanger et al., 2013). Discrimination against Indigenous people in housing both by landlords and other housing providers is also common (Anderson & Collins, 2014).

Another population-specific definition of homelessness that has been developed pertains to youth (Canadian Observatory on Homelessness, 2016), who comprise 20% of people experiencing homelessness in Canada (Gaetz et al., 2016). Youth homelessness has been defined by the Canadian Observatory on Homelessness (2016) as "…the situation and experience of young people between the ages of 13 and 24 who are living independently of parents and/or caregivers, but do not have the means or ability to acquire stable, safe or consistent residence" (p. 1).

The frequency and length of time homeless has also been categorized albeit not consistently internationally (Fazel et al., 2014; Government of Canada, 2020). Chronic homelessness entails the experience of homelessness "lasting more than a year, or four episodes of homelessness in the previous 2 years in an individual who has a disabling condition" (Fazel et al., 2014, p. 1532). Intermittent (also called episodic) homelessness involves people experiencing multiple occurrences of homelessness, while transitional (also called crisis) homelessness involves shorter-term homelessness as a result of an acute event (e.g., earthquake, eviction, or sudden unemployment; Fazel et al., 2014).

1.2. Health and social problems associated with homelessness

Housing is an important social determinant of health (Mikkonen & Raphael, 2010). Generally, prior studies have found homelessness to be associated with poorer physical health outcomes when compared to respective general populations, and these health outcomes are even worse for those people experiencing chronic homelessness (Fazel et al., 2014). And other than serving as a dignity-depriving, extremely marginalizing, and stressful experience, there are also a myriad of other adverse health and social outcomes associated with the lack of housing. For example, systematic reviews and meta-analyses have found higher rates of the following among people experiencing homelessness: cardiovascular disease (Al-Shakarchi et al., 2020), infectious diseases such as HIV, hepatitis C, and tuberculosis (Beijer et al., 2012), traumatic brain injuries (Stubbs et al., 2020), suicide (Ayano, Tsegay, et al., 2019), serious mental illness (Ayano, Shumet, et al., 2020; Ayano, Solomon, et al., 2020; Ayano, Tesfaw, et al., 2019; Fazel et al., 2008), drug and alcohol dependence (Fazel et al., 2008), and accelerated aging and premature aging-related conditions such as limitations in daily living and falls (Suh et al., 2020). Additional studies have found elevated rates of violent and criminal victimization (Nilsson et al., 2020) and food insecurity (Hernandez et al., 2019) and insufficiency (Baggett et al., 2011).

Consequently, homelessness is associated with a two to ten times higher age-standardized mortality ratio compared to the general population (Barrow et al., 1999; Fazel et al., 2014; Ivers et al., 2019; Roncarati et al., 2018), with substance use-related factors commonly found as the leading cause of death (Baggett et al., 2013; Ivers et al., 2019; Roncarati et al., 2018). Even when compared to individuals with housing from poorer socioeconomic neighbourhoods, homelessness has been found to be associated with a significantly increased risk of death (Morrison, 2009). It has been estimated that the mean life expectancy for people experiencing homelessness is 42-52 years (O'Connell, 2005); the lower end of that estimate is almost half of the life expectancy experienced in Canada (World Health Organization, n.d.).

Homelessness has also been associated with institutional admissions, such as hospitalizations (Hwang et al., 2013), hospital readmissions (Khatana et al., 2020; Laliberté et al., 2019; Saab et al., 2016), frequent emergency department use (Lin et al., 2015; Salhi et al., 2018), incarceration (Greenberg & Rosenheck, 2014; Whittaker et al., 2015), and reincarceration (Lutze et al., 2014; Metraux & Culhane, 2004). The term "revolving door syndrome" is commonly used to describe the experience of repeated institutional admissions among people experiencing homelessness.

When considering explanations for the relatively high rates of specific adverse health and social problems among people experiencing homelessness, the relationships may be direct and/or as a result of other factors that are associated with the health/social problem of interest and also homelessness (e.g., acting like a confounder). For instance, the prevalence of food insecurity has been found to be several times higher among people experiencing homelessness relative to the general population (Hernandez et al., 2019). Explanations for this phenomenon involve both the direct effects of homelessness itself (such as the potential lack of storage space and kitchen appliances inherent to living outdoors) and other factors that are more likely to be present among people experiencing homelessness and that also contribute to food insecurity (e.g., low income; Wicks et al., 2006).

More generally, people experiencing homelessness face considerable barriers to access preventative health services, which may exacerbate health problems. For example, immediate subsistence needs may be prioritized over preventative health services like primary care; this phenomenon has been referred to as "competing priorities" (Gelberg et al., 1997, p. 217). This may also lead to complications eventually requiring emergency services or hospitalization (B. White & Newman, 2015). There are also other barriers to health services, including, but not limited to perceived discrimination, feeling dehumanized by health professionals (Wen et al., 2007), lacking health insurance (Baggett et al., 2010; B. White & Newman, 2015) and lacking a usual care provider (B. White & Newman, 2015).

In terms of the temporal direction of the association between homelessness and adverse health and social outcomes, in some cases, the relationship is unidirectional, but in other cases, it may be bi-directional. For example, homelessness is considered a risk for freezing and non-freezing cold injuries (Heil et al., 2016). The direction in this case is clear as these injuries would be a consequence of living outdoors for extended periods of time. However, in other cases, the relationship may be bi-directional, such as in the case of substance use (T. Johnson et al., 1997). For example, one prospective study found drug and alcohol dependence specifically to each be independently associated with first-time homelessness (Thompson et al., 2013). Another study found homelessness to itself be an independent risk factor for initiating drug use (T. Johnson & Fendrich, 2007).

1.3. Homelessness and serious mental illness

There are many subpopulations of people who experience homelessness, including, but not limited to Indigenous people, seniors, youth, families, refugees, people from LGBTQ2S communities, and people fleeing violence (Gaetz et al., 2016).

People experiencing serious mental illness (PESMI) are another subpopulation disproportionately represented among those experiencing homelessness. Fazel et al. (2008) conducted a meta-analysis to estimate the prevalence of mental illnesses and substance use disorders among people experiencing homelessness from Western countries and reported 12.7% for psychotic illnesses, 11.4% for major depression, 37.9% for alcohol dependence, and 24.4% for drug dependence. More recent international meta-analyses have found the pooled prevalence of schizophrenia (10.3%; Ayano, Tesfaw, et al., 2019) and bipolar disorder (11.4%; Ayano, Shumet, et al., 2020) to be about 25 and 11 times higher than the estimated prevalence of these disorders in the general population, respectively.

People experiencing homelessness and serious mental illness (PEHSMI) as a population have elevated prevalence rates of a myriad of adverse health and social outcomes compared to people who are housed and experiencing serious mental illness, including victimization, criminal behavior, and criminal justice involvement (Roy et al.,

2014). Generally, among people experiencing homelessness, the presence of mental illness or mental health problems increases the risk of poorer physical health, victimization, and frequent emergency department use and hospital admissions (Fazel et al., 2014). The experience of food insecurity also seems to be more common among PEHSMI compared to other populations of people experiencing homelessness (Parpouchi, Moniruzzaman, Russolillo, et al., 2016). With regard to mortality, the experience of having a psychotic disorder among people experiencing homelessness under the age of 55 has been significantly associated with an increased risk of death (Jones et al., 2020). Also concerning is the finding that compared to those experiencing transitional homelessness, those experiencing chronic and episodic homelessness are more likely to have a serious mental illness (Kuhn & Culhane, 1998). Among PEHSMI, several specific factors have been found to be associated with a greater duration of cumulative homelessness, such as having first experienced homelessness at a younger age, alcohol use, daily substance use, and having not completed high school (Patterson et al., 2012).

Societal costs related to PEHSMI are also considerable. For instance, Latimer et al. (2017) estimated the mean annual societal cost associated with PEHSMI to be about $59,000 per person in larger Canadian cities (Vancouver, Toronto, and Montreal). Participants with poorer community functioning and multiple psychiatric hospitalizations were each associated with a significantly greater cost.

In order to understand the reasons behind and solutions to homelessness among PESMI at present, it is important to understand the historical context of housing and health and social service provision to PESMI. Mental health treatment and services went through overlapping phases of transformation, from institutionalization, to deinstitutionalization, to the development of various models of housing and support in the community, namely custodial housing, supportive housing, and supported housing. This history will be the focus of the next few sections.

1.4. Deinstitutionalization

Medical, psychological, and social services for PESMI were provided in large psychiatric hospitals during the second half of the 19th century (Rochefort, 1996) and continued until the 1950s (Bachrach, 1976). During this period, it was not uncommon for people to stay in these institutions indefinitely (G. Nelson & MacLeod, 2017) and very often involuntarily (Bellesheim, 2016; Human Rights Watch, 2003). The phenomenon of "learned helpless[ness]" (Cnaan et al., 1988, p. 63) was observed among patients as a result of spending many years in psychiatric hospitals dependent on staff. Patients generally did not have rights and there was "disregard for patient autonomy, dignity, and confidentiality" (Bellesheim, 2016, p. 608). Reports of abuse, neglect, and inhumane treatment of patients (Aderibigbe, 1997; Lamb, 1984; Turner, 2004) living in harmful conditions, including unsanitary and overcrowded hospital environments, also began to surface (Aderibigbe, 1997; Bellesheim, 2016). Commencing in the mid 1950s, however, mental health care for PESMI in the U.S. went through a transformation referred to as deinstitutionalization (Bachrach, 1976). Deinstitutionalization has been "defined as the replacement of long-stay psychiatric hospitals with smaller, less isolated community-based service alternatives for the care of mentally ill individuals" (Bachrach, 1996, p. 4). In Canada, this process started in the 1960s (Davis, 2014). For example, there was an overall 70.6% decrease in the amount of beds in Canadian psychiatric hospitals between 1965 and 1981 (Sealy & Whitehead, 2004).

The impetus for deinstitutionalization was multifactorial. For instance, as mentioned above, disturbing reports of abuse and neglect of patients in psychiatric hospitals had surfaced. Antipsychotic medications were also developed in the 1950s and 60s (Bellesheim, 2016; Turner, 2004) facilitating treatment and rehabilitation in the community (Lamb, 1994). Additionally, it was thought that care provided outside of hospitals and in the community would be cheaper (Turner, 2004) and more humane (Aderibigbe, 1997). Advocacy for patients' rights also increased during the 1960s with psychologists advocating for the well-being of individuals living with mental illness and the need for support and reduced stigma in the community (Bellesheim, 2016). Lawyers successfully made the case that psychiatric hospitals violated patients' civil rights,

(Klerman, 1985) consequently making involuntary commitment more difficult (Lamb, 1984).

1.5. Housing and support services following deinstitutionalization

During the decades following the advent of deinstitutionalization up until the present, models of housing and support for PESMI went through three phases of development outlined in Table 1.1: 1) custodial housing, 2) supportive housing, and 3) supported housing (Parkinson et al., 1999). Large-scale homelessness also developed in the 1980s (Gaetz et al., 2016; Hulchanski et al., 2009). A brief description of the aforementioned housing models and rise in homelessness follows.

Table 1.1.   Key qualities of the three approaches to housing[1]

Key dimensions	Type of housing		
	Custodial	Supportive	Supported
Underlying values	Custodial care	Rehabilitation	Empowerment and community integration
Typical Settings	Board-and-care homes Foster families	Small group homes Clustered apartments	Cooperatives Apartments
Location	Predominantly inner-city	Predominantly inner-city	Anywhere
Number of people living in setting	Varies from small to large number of people with disabilities	Typically small to medium number of consumer/survivors	Typically a small number of people
Role of consumer/survivor	Patient/client	Resident	Tenant/citizen
Role of staff	Care provider	Rehabilitation agent	Facilitator
Intervention orientation	Deficit focus	Focus on deficits and strengths	Strengths focus
Nature of support	In-house staff support Oriented toward care and dependency	In-house staff and peer support Oriented toward independence	Staff support from outside Support process controlled by tenant
Degree of empowerment (choice and decision-making)	Little choice over the type of housing, living companions, or support received Staff have control over most of the decisions in the residence	Little choice over the type of housing, living companions, or support received Staff and consumer/survivors make most decisions together	Complete control over the type of housing, living companions, and support received Tenant has control over all decisions regarding their housing
Stability	Long-term	Can be long-term, but is usually used or short term	Long-term

[1.] Adapted by author from: Parkinson et al. (1999, p. 146)

1.5.1. Custodial housing

The planning and implementation of community-based housing and services did not increase commensurately with deinstitutionalization (Lamb, 1984; G. Nelson & MacLeod, 2017). As a result, other than housing and support provided by one's family (Lamb, 1984), custodial housing was the main type of housing and support provided in the community, which included, but was not limited to, boarding houses, special care homes, and nursing homes (G. Nelson & MacLeod, 2017; Trainor et al., 1993). Residents in custodial housing were not expected to contribute to any chores (Parkinson et al., 1999), and, given the congregate nature of the housing, some shared rooms as a requirement, affecting privacy (Trainor et al., 1993). Staff in these settings provided services that addressed subsistence needs and medication without rehabilitative programming designed to increase independent functioning in the community (G. Nelson, 2010). Moreover, residents did not have a say in the type of housing or services they received (Parkinson et al., 1999). Viewed historically, the custodial model has been referred to as a "mini-institution" (G. Nelson & MacLeod, 2017, p. 8), operating in a similar custodial fashion to psychiatric hospitals prior to deinstitutionalization. As G. Nelson and Macleod (2017) argue, "rather than being viewed as citizens or community members with rights, patients were seen as the objects of custodial care… [and were] still viewed as sick and as in need of lifelong care or treatment" (p. 6).

1.5.2. Supportive housing & large-scale homelessness

Concerns regarding the limitations of custodial housing led to the development of a model called supportive housing (G. Nelson, 2010) in the 1970s (Carling, 1990) which focused on the development of skills and functioning (Ridgway & Zipple, 1990). Supportive housing is based on what has been referred to as the "linear residential continuum model" (Ridgway & Zipple, 1990, p. 12) of housing, treatment, and rehabilitation services. At the beginning of the continuum, residents usually start in congregate housing (e.g., group homes or halfway houses) with many rules and restrictions as well as an intensive level of treatment involving rehabilitation (Ridgway & Zipple, 1990; Tsemberis & Eisenberg, 2000). As the person's community functioning

improves, they advance to the next setting on the continuum. Each successive setting includes reductions in rules/restrictions, supervision, and treatment intensity, and increased independence culminating in independent apartments in the community (Ridgway & Zipple, 1990). A fundamental assumption inherent to supportive housing is that PESMI first require mastery of specific rules before living in their own apartment. To achieve this goal, residents are expected to adhere to rules and treatment (e.g., treatment for mental illness and maintenance of substance use abstinence), as a condition of receiving housing and support (Tsemberis & Eisenberg, 2000). Those exhibiting a deterioration of community functioning are placed in a previous setting on the continuum. The expected amount of time people spend in each setting is usually predetermined based on the average duration of tenancy by previous residents (Ridgway & Zipple, 1990).

Supportive housing faced several challenges, providing the impetus for further change. For example, although respite services were often available for crises requiring temporary intervention (Ridgway & Zipple, 1990), many people did not advance through the continuum because they were asked to leave due to non-adherence to programmatic requirements (Tsemberis et al., 2004). Many others did not access these services in the first place because of the rules and restrictions in place (Tsemberis et al., 2004). For those people who did successfully complete the linear residential continuum, there was often an undersupply of independent housing (Ridgway & Zipple, 1990). Even when independent housing was available, the expectation that PESMI completing the linear residential continuum would be able to maintain independent housing without continued support was unlikely to be realized (Ridgway & Zipple, 1990). An additional major development commenced in the 1980s; homelessness developed as a social problem and on a mass scale in high income countries (Gaetz et al., 2016; Hulchanski et al., 2009).

As Hulchanski et al. (2009) argue:

Before the 1980s, people in developed countries did not know what it was like to be unhoused or homeless. They had housing, even if that housing was in poor condition. Some transient single men in cities were referred to at times as 'homeless.' But the term had a different meaning then. (p. 2)

Even the term "homelessness" itself was infrequently mentioned prior to the 1980s until it was used to describe the observation "…that an increasing number of people who were once housed in these wealthy countries were no longer housed" (Hulchanski et al., 2009, p. 2). In the case of Canada, since the end of World War II, its federal government had treated housing as a human right, albeit not formally legislated as such (Gaetz, 2010). For example, the government provided funding for social housing units to be built in the tens of thousands annually, as well as rent subsidies to be used in the private market (Hulchanski et al., 2009). A stronger social safety net had accompanied such housing in place to assist with lower incomes and health problems and crises.

Starting in the mid 1980s, however, the Canadian government began cutting social spending, including social and co-op housing and social supports (Gaetz, 2010; Gaetz et al., 2016; Hulchanski et al., 2009). In an effort to increase homeownership, federal government lending initiatives aimed at promoting new affordable housing units via provision of low-interest loans were reduced (Kalman-Lamb, 2017). These cuts contributed to a reduction to the affordable housing supply which consequently raised rent amounts making housing even more unaffordable for people with lower incomes. Federal funding of social housing was completely halted in 1993, which specifically ended any and all spending on new social housing units (Hulchanski et al., 2009). And starting in 1996, Canadian provinces were expected to fully manage and fund the maintenance of social housing units that had already been built. The aforementioned spending cuts were part of the new neoliberal policy agenda developing a political economy characterized by lower taxes, less government social spending via privatization of public social services (Dunlop, 2006; Gaetz, 2010; Hulchanski et al., 2009), globalization of markets (Dunlop, 2006), and the financialization of housing as a market commodity (Kalman-Lamb, 2017). These policy changes came with the promise of benefits for everyone, including those in poorer socioeconomic classes, via "trickle-down economics" that was to come to fruition by the private market (Gaetz, 2010; Hulchanski et al., 2009). However, this promise did not come to fruition, and instead, homelessness became a new normal, poverty was exacerbated (Gaetz, 2010; Hulchanski et al., 2009), the assistance provided to people of lower socio-economic status became inadequate (Gaetz, 2010), all while people of higher socio-economic status benefited both during

13

economic recessions and upturns (Hulchanski et al., 2009). There was also a decrease in new social housing units built annually in Canada going from over 30,000 in 1972 to about 1000 in 2010 (Walks & Clifford, 2015). Home ownership and the number of condominiums surged with the simultaneous decrease in affordable rental units (Gaetz, 2010).

Some efforts were targeted towards addressing homelessness, but largely in the form of emergency supports and services (e.g., homeless shelters; Gaetz, 2010; Gaetz et al., 2016). As Gaetz et al. (2016) argue, a system focused on emergency services is inadequate to address primary prevention as well as ending homelessness once it occurs. Similar social assistance cuts were made in the U.S. around the same time period preceding a rise in large-scale homelessness in the 1980s (Mathieu, 1993). Dunlop (2006) argues that "despite the different political ideologies that have shaped the social welfare systems in Canada, the United Kingdom and the United States, they are moving closer together in their ideas about dismantling the welfare state" (para. 13).

Contemporaneous with the homelessness crisis and realization and recognition of the limitations of supportive housing, homelessness linked to mental illness became a major political issue (Ridgway & Zipple, 1990). At the individual level, it has been argued that inadequacies in three domains contribute to homelessness; these include housing, income, and support services (Hulchanski et al., 2009). Neoliberal policies in the 1980s affected all of these domains, creating a perfect storm, especially for PESMI. However, it is important to note that although PESMI may have been one of the first populations to be noticed as being affected by homelessness, "homelessness affects a much broader segment of the poor in general and is not unique to people with severe mental illness" (Draine et al., 2002, p. 570). Nevertheless, the inadequacy of community supports following deinstitutionalization combined with poverty, unaffordable housing, and discrimination contributed to increasing numbers of people experiencing mental illness becoming homeless (Blanch et al., 1988; Carling, 1990, 1993; Schiff et al., 2010). As Ridgway (1988) describes, PESMI began advocating directly for housing as a crucial component of a larger objective involving community integration (as cited in Ridgway & Zipple, 1990). This movement, also referred to as the "consumer movement" (Stromwall

& Hurdle, 2003, p. 208) and "disability rights movement" (Stromwall & Hurdle, 2003, p. 208), also argued that choice in receiving treatment is a human right (Greenwood et al., 2005). The linear residential continuum was criticized as placing undue stress on residents as a result of the requirement to move from one setting to another multiple times (Ridgway & Zipple, 1990). There also existed a paradox that residents faced in supportive housing: "when a client 'graduates' to a more independent setting, he or she faces a more demanding living situation with less formal support" (Ridgway & Zipple, 1990, p. 21).

Two additional major developments occurred during the 1970s and 1980s and converged with the above dynamics. The first was the development of a rigorous model of care known as assertive community treatment (ACT), whereby a multi-disciplinary team of health and social service practitioners provide long-term support to PESMI in the community (Ridgway & Zipple, 1990; Stein & Test, 1980). ACT has been referred to as "the hospital without walls" (Solomon et al., 2011, p. 41). Second, the model known as psychosocial rehabilitation (Cnaan et al., 1988) rose in prominence and fundamentally challenged the assumptions of supportive housing and the linear residential continuum model it was based on. These developments paved the way for a paradigm shift from supportive housing to supported housing (Carling, 1990; Ridgway & Zipple, 1990; Tsemberis & Eisenberg, 2000). ACT and the psychosocial rehabilitation model will be discussed in more detail in sections 1.6.2 and 1.7, respectively.

1.5.3. Supported housing

Supported housing developed in the 1980s and encompassed the third major change in models of housing and support post-deinstitutionalization (Wong et al., 2007). Essentially, supported housing is comprised of independent housing for PESMI, with health and social services provided separately in the community (Carling, 1992; Wong et al., 2007). The model is focused on empowerment of PESMI by enabling choice over housing and rehabilitation services received (Parkinson et al., 1999). In a review of the literature, Wong et al. (2007) identified four principles of supported housing: 1) housing is a human right for people with disabilities; 2) PESMI are community members; 3) the

goal of service staff is to promote empowerment; and 4) residents' right to housing is independent from their engagement in treatment/support.

A recent review of independent housing and support for PESMI concluded that many studies did not include fidelity assessments confirming adherence to the above principles and therefore precluding conclusive interpretations of their findings (Richter & Hoffmann, 2017a). Several other reviews of supported housing studies have also been published over the past two decades. The earliest ones found too few studies to make robust conclusions (Ogilvie, 1997; Parkinson et al., 1999). Subsequent reviews found the supported housing model to be inconsistently defined (Fakhoury et al., 2002; Rog, 2004; Tabol et al., 2010), with variation or unclear descriptions, making it difficult to distinguish the type of housing being described (e.g., supportive vs. supported housing; Benston, 2015; G. Nelson, 2010; Rog et al., 2014; Tabol et al., 2010). Significant methodological limitations were also found (Benston, 2015; Fakhoury et al., 2002; Leff et al., 2009; Rog, 2004; Rog et al., 2014; Tabol et al., 2010). Furthermore, two Cochrane reviews were conducted on supported housing and each reported that no studies met their inclusion criteria (Chilvers et al., 2002, 2006).

Offering a potential response and rejoinder to the above limitations, the supported housing model known as Housing First (HF) has been well-defined (Stefancic et al., 2013), adopted by national governments (Government of Canada, 2019; United States Interagency Council on Homelessness (USICH), 2018), and evaluated using experimental designs in North America and Europe after the aforementioned Cochrane reviews were conducted (Goering et al., 2011; Padgett et al., 2006; Tinland et al., 2013). As G. Nelson and MacLeod (2017) have described, the term "'supported housing'… has largely given way to the term 'Housing First'" (p. 11). HF will be the focus of the next section.

1.6. Housing First

Research enumerating homelessness in New York City in the 1980s reported a substantial proportion also living with serious mental illness or having had experienced mental illness (25%-37%; Plapinger et al., 1988, as cited in Tsemberis & Asmussen,

1999; Struening, 1987, as cited in Tsemberis & Asmussen, 1999; Susser et al., 1988, as cited in Tsemberis & Asmussen, 1999). These statistics were viewed by local psychologists, Dr. Sam Tsemberis and Dr. Sara Asmussen, as "clearly indicat[ing] that the existing system is simply ineffective for a large number of individuals who remain homeless and mentally ill" (Tsemberis & Asmussen, 1999, p. 116). Such findings, combined with accumulating criticism of the linear residential continuum model, led Dr. Tsemberis to found HF (originally called the Consumer Preference Supported Housing model) via a nonprofit organization called Pathways to Housing (Tsemberis & Asmussen, 1999). This was done in collaboration with PESMI, researchers, and clinicians (Tsemberis, Moran, Shinn, Asmussen, & Shern, 2003). The key principles of HF are summarized in Table 1.2, including practice examples.

Table 1.2.   Principles and practices of Housing First

Principle[1]	Examples of practices
Housing as a basic human right	Housing is provided as a right to all PEHSMI without treatment conditions
Respect, warmth, and compassion for all clients	This principle guides all communication between staff and clients (verbal and nonverbal)
A commitment to clients	Staff remain committed to helping clients through the ups and downs of recovery including crises
Scattered-site housing	An apartment is provided to each client as per their preference based on an inventory of suites throughout different neighbourhoods. Clients sign the lease and spend ≤30% on rent.
Separation of housing and services	Health/social services in the form of ACT or ICM are located in the community separate from the client's apartment and delivered in a location per client preference
Consumer choice and self-determination	Clients are encouraged to make their own life decisions with support provided. Clients choose all aspects of their housing and services to engage in
A recovery orientation	All practices are aimed at facilitating recovery, from enabling choice and self-determination in housing, services, and life goals, to communication in a way that fosters hope, to interventions aiding in the development of meaningful roles and activities (e.g., supported employment and leisure).
Harm reduction	Clients do not have to abstain from substance use. The focus of the program is to reduce harms of substance use, mental health symptoms, and risky behaviours.

[1]. Principles reproduced by author from: (Tsemberis, 2015, p. 18)

At its most basic level, HF facilitates immediate access to independent housing with health and social services provided separately in the community (Greenwood et al., 2013; Tsemberis & Asmussen, 1999; Tsemberis & Eisenberg, 2000). This supported housing program was created for PEHSMI or concurrent substance use disorders (Greenwood, Stefancic, & Tsemberis, 2013; Tsemberis & Asmussen, 1999). Formal program eligibility criteria include: 1) being homeless, 2) living with a mental illness that interferes with functioning (DSM Axis I), 3) agreeing to enroll in the program's money management service, and 4) agreeing to meet with the service coordinator twice monthly (Tsemberis, 1999; Tsemberis & Asmussen, 1999). The latter two service engagement requirements are flexible (Tsemberis & Eisenberg, 2000).

1.6.1. The housing in Housing First

Potential clients of HF are identified via outreach teams (i.e., staff from Pathways to Housing) or via referral from other community agencies (Tsemberis & Eisenberg, 2000). Clients are first asked to choose the apartment and neighbourhood they would like to move in to (Greenwood et al., 2013; Tsemberis, 1999) from those available in the private market (Tsemberis & Eisenberg, 2000). These apartments are in dispersed locations (Greenwood et al., 2013; Tsemberis & Eisenberg, 2000) and range from studio to two-bedroom suites (Tsemberis & Eisenberg, 2000). Pathways to Housing ensures that clients of their program comprise no more than 20% of tenants in any single building (Stefancic et al., 2013). The lease is legally held by the client, but in cases where the landlord of the property insists, the lease is held by Pathways to Housing and a sublease is then signed by the client (Tsemberis, 1999). Housing is also permanent (Greenwood et al., 2013; Tsemberis, 1999; Tsemberis & Eisenberg, 2000; Tsemberis et al., 2003). If the person would like to move out or is evicted, the program finds an alternative suite as per the client's preference (Stefancic et al., 2013). If an apartment is not immediately available for a new client, Pathways to Housing has temporary accommodation available until an apartment is found (two weeks average; e.g., YMCA, hotel, etc.; Tsemberis, 2015; Tsemberis & Asmussen, 1999). Clients maintain their housing even if crises occur involving, for example, hospitalization, mental health symptoms, or substance use relapse. This is because housing is separate from treatment and services that are provided

as part of the HF program (Tsemberis, 1999; Tsemberis & Asmussen, 1999; Tsemberi et al., 2012; Tsemberis et al., 2003), and because Pathways to Housing has emergency funds available to help clients in crisis (Tsemberis & Asmussen, 1999). Subsidies provided by the program ensure that the client does not pay any more than 30% of their income for housing (Tsemberis, 1999; Tsemberis & Asmussen, 1999). The program's money management service helps in this regard as Pathways to Housing becomes the client's representative payee and pays rent on time and on their behalf; the remainder of the client's income is either provided in installments as per budgeting agreements (e.g., for food) with their case manager, or it is provided in one lump sum (Tsemberis & Asmussen, 1999).

1.6.2. Treatment and services in Housing First

The next step involves assignment of a case manager to the client to coordinate services needed (Tsemberis & Asmussen, 1999). Health and social services are delivered via two different types of teams: assertive community treatment (ACT) or intensive case management (ICM; Stefancic et al., 2013). The participant:staff ratios for ACT and ICM teams are not to exceed 10:1 and 20:1, respectively. ACT has been referred to as "the hospital without walls" (Solomon et al., 2011, p. 41), as it was designed to take on many of the services offered in psychiatric institutions but deliver them in the community. The ACT used in HF is made up of a multi-disciplinary team providing health and social services (Greenwood et al., 2013). It is based on the original ACT model developed by Stein and Test (1980), however, a few modifications have been made. For example, a housing specialist, nurse, and multiple peer counselors have been added to both manage housing services and address the complex health conditions clients may have (Tsemberis & Asmussen, 1999; Tsemberis et al., 2004). Moreover, clients choose the services that best address their needs and can choose not to engage in other services offered (Tsemberis & Eisenberg, 2000). A HF ACT team includes a team leader, administrative assistant, housing specialist, nurse, primary care practitioner, psychiatrist, substance use treatment provider, vocational specialist, case manager, social worker, peer counselor, illness management recovery specialist, and substance use counselor (Greenwood et al., 2013; Tsemberis, 2015; Tsemberis & Asmussen, 1999; Tsemberis et al., 2004). Optional

team members include a family systems specialist and occupational therapist (Tsemberis, 2015). External agencies and treatment services are used as needed (Tsemberis, 1999; Tsemberis & Asmussen, 1999) and such is usually the case for the housing specialist, administrative assistant, and primary care practitioner (Tsemberis, 2015). HF clients are required to meet with ACT team members at least once weekly; this is done to ensure safety, well-being, maintain communication, and to provide emotional support and any help needed (Stefancic & Tsemberis, 2007).

ICM teams serve clients that have a lower level of need for support (Greenwood et al., 2013) either at program entry or after being served by the ACT team (Tsemberis et al., 2012). The role of ICM teams is to facilitate clients' access to external treatment and service agencies as needed (Stefancic et al., 2013) and provide assistance with activities of daily living (e.g., cooking and budgeting; Tsemberis, 2015). Program staff of both teams are available 24 hours a day (Tsemberis, 1999; Tsemberis & Asmussen, 1999; Tsemberis et al., 2003). A HF ICM team includes a team leader, intensive case managers, and a program assistant (Tsemberis, 2015).

HF clients are also required to meet with a case manager at least twice monthly (Greenwood et al., 2013; Tsemberis, 1999). Services from both ACT and ICM teams are provided in clients' homes or in the community at the discretion of the client, and all services are person-centred (Tsemberis & Asmussen, 1999; Tsemberis et al., 2012). For example, treatment and service planning is directed by the client and their perceived needs as opposed to the health/social service provider. This means that the treatment provided, its intensity, and pace is decided by the client in consultation with the health/social service provider. Housing and services are also designed to facilitate community integration, and hence, rehabilitation is provided in areas such as living independently, applying for social assistance benefits, employment skills, interpersonal skills, negotiating with landlords, managing finances, participation in community leisure activities, family reunification, self-care, grocery shopping, and furthering formal education (Greenwood et al., 2013; Tsemberis, 1999; Tsemberis & Asmussen, 1999; Tsemberis & Eisenberg, 2000). Harm reduction is another modification to the ACT model used with respect to substance use, treatment engagement (Tsemberis &

Asmussen, 1999; Tsemberis & Eisenberg, 2000), and risk behaviours (Tsemberis, 1999). That is, HF clients do not have to abstain from substance use nor engage and adhere to treatment services offered in order to maintain housing (Tsemberis, 1999; Tsemberis & Asmussen, 1999). Instead, staff focus on reducing harms related to clients' substance use and related risk behaviours (Marlatt, 1996). However, treatment adherence is required in extenuating circumstances (e.g., court ordered requirements such as substance use treatment or clients posing immediate risks to others or themselves; Tsemberis & Asmussen, 1999). Consistent with such extenuating circumstances, staff may intervene in the client's finances to control spending if they are spending it all on substances (Tsemberis, 1999).

It is important to note that although the original HF model utilizes scattered-site housing with suites dispersed in various neighbourhoods and ACT and ICM teams located in the community, congregate HF has also been developed as an adaptation (Tsemberis, 2012). One of the differences from scattered-site HF is that the congregate configuration involves a single building in which each client is provided a studio suite but is expected to share other amenities (e.g., dining). Another difference is that the health and social service teams are located within these same congregate buildings (i.e., on-site; Somers, Patterson, et al., 2013). A limitation of only having congregate HF available in a given service area is that it limits client choice because most HF recipients prefer an independent apartment (Tsemberis, 2012). This is further supported by a meta-analysis that reported that 84% of people experiencing homelessness and living with a mental disorder preferred independent housing compared to other settings (e.g., congregate; Richter & Hoffmann, 2017b).

Another adaptation of HF is its use for other populations of people experiencing homelessness. Investigations of HF in the past have involved a variety of populations experiencing homelessness, some of which include youth (Gaetz, 2014), people living with HIV/AIDS (Wolitski et al., 2010), and people with problematic alcohol use (Larimer et al., 2009).

1.6.3. Opposition to Housing First

Pathways to Housing's HF model faced considerable push back in its early conception and along the way to national and international adoption (Greenwood et al., 2013). Criticism of the HF model proposed by Dr. Tsemberis was strong from people subscribing to the linear residential continuum model. They believed PEHSMI are "not housing ready" (Greenwood et al., 2013, p. 655) and first require treatment and rehabilitation. Others went as far as calling HF a harmful and "reckless" (Greenwood et al., 2013, p. 649) program. Harm reduction was also a very controversial approach to substance use, serving as an impediment to securing funding (Greenwood et al., 2013).

HF represented a new approach to providing housing and support to PESMI, and it evoked instant push back because it was based on assumptions about rehabilitation that went against the proverbial grain (Greenwood et al., 2013). That is, it went against the theoretical assumptions of the linear residential continuum model. But what theoretical assumptions was HF based on? Dr. Sam Tsemberis has explicitly stated that HF is based on what has been called the psychosocial rehabilitation model (also called the psychiatric rehabilitation model; Tsemberis, 2013). This model will be the subject of the next section. It is important to note that historically, the term "psychiatric rehabilitation" has been distinguished from the term "psychosocial rehabilitation" based on disciplinary grounds (medical vs. social, respectively; Flexor and Solomon, 1993, as cited in Corrigan et al., 2008). However, these terms are now used interchangeably (Bachrach, 1992). In subsequent sections, only the term psychosocial rehabilitation will be used for consistency.

1.7. The psychosocial rehabilitation model

Proposed as an alternative to the biomedical approach to mental illness (Cnaan et al., 1988), the psychosocial rehabilitation model (PRM) has been defined as helping "persons with psychiatric disabilities to increase their ability to function successfully and to be satisfied in the environments of their choice with the least amount of ongoing professional intervention" (Anthony et al., 2002, p. 101). Although fragments of PRM

have developed since the 19ᵗʰ century, deinstitutionalization involving a shift to mental health care delivery in the community provided fertile ground (Anthony & Liberman, 1986) for PRM experts to further define and advocate the model, especially in the 1960s and 1970s (Lamb, 1994).

The system of mental health services that developed during the early days of deinstitutionalization was heavily criticized by psychosocial rehabilitation experts. Anthony (1977), for example, contended that inadequate attention to and understanding of psychosocial rehabilitation among mental health care providers impeded community integration among clients. In describing the mental health services that emerged during deinstitutionalization (e.g., custodial housing) and the dependence it created between patients and their care providers, Anthony (1977) states that:

> What the policymakers in the field of mental health have failed to realize is that the development of alternative environmental support systems is not a psychological-rehabilitation method. Placing the psychiatrically disabled person in a noninstitutional environment is not the whole rehabilitation program or method, it is only a preparatory step. If this placement is considered the entire program then what happens is that the patient merely becomes dependent on a different support system; the patient has not been taught to be any more productive or capable. Once that support system is withdrawn, the patient will closely resemble the psychiatrically disabled patients who have remained dependent on the traditional inpatient support system. (p. 660)

Anthony (1977) further goes on to point out the irony in such programs, defining them as "the development of nontraditional psychiatric settings for the purpose of using traditional psychiatric techniques by traditionally trained personnel" (p. 660). Others argued that the alleviation of symptoms as the sole focus of treatment is insufficient for patients to develop independent functioning in the community (Bell & Ryan, 1984).

The overall goal of psychosocial rehabilitation is to facilitate and support independent living and functioning in the community among PESMI (Cnaan et al., 1988). And in the words of Warner (2012), "psychiatric rehabilitation provides a road to recovery. The goal of rehabilitation is to help people with a disability enjoy the best and

fullest life possible" (p. 225). Psychosocial rehabilitation in practice follows the acute phase of mental illness (e.g., psychosis; Anthony & Liberman, 1986).

In reviewing literature pertaining to PRM, Cnaan et al. (1988) outlined 13 PRM principles listed below:

1. "Underutilization of full human capacity" (p. 64)

2. "Equipping people with skills (p. 64)

3. "Self-determination" (p. 65)

4. "Normalization" (p. 66)

5. "Differential care needs" (p. 66)

6. "Commitment of staff" (p. 67)

7. "Deprofessionalization of service" (p. 68)

8. "Early intervention" (p. 68)

9. "Environmental approach" (p. 69)

10. "Changing the environment" (p. 70)

11. "No limits on participation" (p. 70)

12. "Work-centred process" (p. 71)

13. "Social rather than medical supremacy" (p. 71)

Further elaboration of each of the aforementioned principles and their assumptions, as described by Cnaan et al. (1988), follows. References are only cited for additional information included from other sources. Each principle will also be followed by a bullet point outlining how it informs HF elements and practices. These bullet points are largely based on the discussion of HF in the previous section (1.6), and references are only cited for new information introduced.

<u>1. Underutilization of full human capacity</u>

This principle speaks to the potential of every single human being living with a psychiatric disability. It operates on the assumption that people living with a psychiatric disability can progress in their functioning and rehabilitation and that mental health staff ought to support and encourage them in doing so. The level of improvement possible will depend on each person and is not predicted apriori.

- Improvement potential is an important assumption inherent to HF. Even when housing is lost due to eviction, alternative apartments are found as per client preference, and this speaks to the assumption that PESMI can progress in their rehabilitation journey with the right supports. The client is not abandoned. Staff instill hope and motivation.

<u>2. Equipping people with skills</u>

Skills development is a necessary part of psychosocial rehabilitation because many people experiencing psychiatric disability have not been adequately supported in learning basic life skills, pursuing formal education (Cnaan et al., 1988), and/or have become dependent (e.g., through institutionalization; Anthony, 1977). This contrasts with the biomedical model's emphasis on clinical symptoms as the central factor related to independent functioning (Cnaan et al., 1988). According to PRM, based on the client's own goals, an evaluation should be done to determine skills the client already has and the ones needed. Learning such skills (e.g., via interpersonal psychotherapy) may also reduce psychosis events and rehospitalization via improvement of problem-solving skills (Wallace & Liberman, 1985).

- Part of the role of the ACT and ICM teams included in HF is to help clients develop the skills they need for independent living in the community, whether this be skills needed for employment, negotiating with landlords, grocery shopping, managing finances, and etc. Harm reduction is also an important component of HF (Gilmer et al., 2014), and this approach is used to assist clients in reducing harms related to substance use and other risk behaviours (e.g., needle-sharing or sexual risk behavior).

3. Self-determination

PRM emphasizes that each person has the right to self-determination and that clients should be free to make their own life decisions with reasonable limitations, even if those same decisions are likely to have negative consequences. This includes declining an offer of treatment. Anthony and Liberman (1986) argue that clients "must be involved as much as possible in setting rehabilitation goals" (p. 554), and these goals should be meaningful to the client (Liberman et al., 2001). Client self-efficacy is an important component of PRM, whether that be through making decisions about one's treatment, developing one's own social circle, or becoming employed (Stromwall & Hurdle, 2003). Key supporters of the client including family members are included in the process of psychosocial rehabilitation (Liberman et al., 2001). PRM also emphasizes that clients should be permitted to share their expertise and feedback with organizations that treat and serve them by being involved in the operation of these organizations (Cnaan et al., 1988).

- Self-determination, client choice (in housing and treatment engagement), and person-centred planning are important components of HF (Gilmer et al., 2014). These components of the model are implemented at the beginning of contact with clients by the outreach team, as clients are directly asked to choose the apartment and neighbourhood they would like to move in to and their life goals. If the client finds that the specific apartment they have chosen is not appropriate for them, HF accommodates a move to another suite, as per the client's preference. With regard to health and social services, clients choose the services that they would like to engage in, and they are free to make choices that staff may disagree with; the rationale for this involves the utility of learning from mistakes and enjoying positive outcomes from choices made (Greenwood et al., 2013). Self-determination is also consistent with the harm reduction approach HF includes as clients are empowered to make their own choices regarding substance use and treatment engagement without fear of being asked to leave the program or being denied entry in the first place (Mancini et al., 2008).

4. Normalization

It is assumed that psychosocial rehabilitation is best facilitated in the "least restrictive environment" (Cnaan et al., 1988, p. 66), the setting that independent living is to be eventually realized, the community. The vast majority (84%) of people experiencing homelessness and living with a mental disorder prefer independent housing

compared to other settings (e.g., congregate; Richter & Hoffmann, 2017b). Treatment and services pertaining to rehabilitation (e.g., social skills development, health care, and grocery shopping) should therefore also be provided in the community (Cnaan et al., 1988) and "independent housing places should exceed institutionalized places by a wide margin" (Richter & Hoffmann, 2017b, p. 822). For example, in order to learn how to shop for groceries, clients should practice and be supported in doing so in actual grocery stores, just like other community members. Dependence on staff should also be discouraged to the highest degree possible (Cnaan et al., 1988).

- HF contributes to "normalization" by facilitating immediate access to permanent independent apartments in the private market where independent living is realized. Clients are viewed as citizens in society with the role of tenant when receiving housing in contrast to the view of PESMI as patients or clients (G. Nelson & MacLeod, 2017). Designed to further contribute to "normalization" or community integration is the requirement that no residential apartment building be comprised of any more than 20% clients. Leases are also legally held by clients, just like other community residents. Housing is also separate from treatment rather than being contingent on it as would be the right of and case for the type of housing that other community members enjoy. ACT and ICM are also offered in the community.

5. Differential needs and care

There are a variety of life domains for people living with mental illness that may need rehabilitation, but this will vary between individuals in terms of specific needs, planning required, and the amount of time it takes towards living more independently. The level of independence possible will also vary between individuals. Some, for example, may need some level of support for the remainder of their lives.

- Person-centred planning is an important component of HF (Gilmer et al., 2014). Members of ACT or ICM teams tailor services as per the client's preference thereby individualizing treatment.

6. Commitment of staff

Because the process of psychosocial rehabilitation can be quite demanding on staff (e.g., managing unpredictable crises on a regular basis and setbacks in improvement) and the model needs to be fully adhered to, staff need to maintain client

motivation and be committed to the principles, assumptions, and practices of PRM (Cnaan et al., 1988). Liberman et al. (2001) further add that a multidisciplinary team with members that are mobile is required for effective rehabilitation. This is due to the varied evidence-based interventions, expertise, and individually tailored treatment and services that are needed. This also includes the coming-together of services informed by the biomedical and psychosocial rehabilitation models (Liberman et al., 2001), and a variety of professionals and paraprofessionals (Anthony & Liberman, 1986).

- ACT is an evidence-based psychosocial rehabilitation service (Solomon et al., 2011) that is inherently multi-disciplinary. The HF model of Pathways to Housing meets most ACT fidelity requirements (exceptions include the modified aspects of the team described in the previous section), meaning that staff are trained and service delivery adheres to its protocol (Teague et al., 1998; Tsemberis & Asmussen, 1999). Moreover, ACT team members include care providers from disciplines informed by both the biomedical model (e.g., nurses) and PRM (e.g., vocational specialists). They collaborate and coordinate services together, as well as with clients. Clients determine the location of service provision and hence ACT teams are mobile and flexible. Similarly, ICM teams coordinate multidisciplinary services and work with clients towards realizing their goals. When hiring staff, Pathways to Housing seeks people "who have a willingness to put the needs of the tenants ahead of all other considerations… [and who are] 'able to work inter-racially and inter-ethnically'" (Tsemberis & Asmussen, 1999, p. 123). Training, supervision, and ongoing feedback are provided to staff in accordance with principles, practices, and values of HF (Tsemberis & Asmussen, 1999). Commitment to clients is a key HF principle as mentioned above.

7. Deprofessionalization of service

The traditional role of the patient and service provider under the biomedical model is not consistent with PRM. Service providers and other staff working within PRM are expected to interact with clients using a person-centred approach and one that is personal. In describing the relationship between the service provider and client within PRM, Cnaan et al. (1988) states that "staff members are concerned with all aspects of the lives of clients and are interested in them as human beings with many dimensions, rather than adopting the perspective of one limited area of service" (p. 68). Service providers are not to remain impartial during the provision of services or in their general interactions with clients while at the same time respecting different views, beliefs, and values the

client may hold. Treatment and other services offered should also be clearly described to the client so they understand what is being provided and to contribute to shared decision-making.

- Clients in HF are considered experts regarding their needs for services (Greenwood et al., 2013). Person-centred planning (Gilmer et al., 2014) enables staff members to collaborate with clients when planning treatment and services. Staff interact with clients in a warm and compassionate manner (Tsemberis, 2015).

8. Early intervention

In times of psychiatric crisis (e.g., deterioration of mental health or emergence of mental health symptoms), early intervention by service providers is important to prevent relapse and subsequent hospitalization and/or loss of community supports (e.g., housing and employment loss). All staff are important in this capacity, but case managers serve an especially vital role in this regard as they should be in a position to recognize early symptoms of crisis. This principle also speaks to the deprofessionalization of services; having a more personal relationship with the client (as opposed to the traditional model of patient and service provider) will enable greater insight into the client's life and familiarity with the client's social network, providing greater opportunity to recognize symptoms of crisis.

- Case managers and other ACT or ICM team members work closely with clients and intervene quickly when crises arise so as to prevent hospitalization (Tsemberis & Asmussen, 1999). Housing and services continue in case of hospitalization or temporary departure from the housing provided. Familiarity with the client and their social circle also improves ability to detect impending crises.

9. Environmental approach

This principle focuses on the people around the client, including their social circle (e.g., neighbours, co-workers, family members, and friends). Collaboration between service providers and members of the client's social circle is important so that they are aware of how they can create a supportive environment. This includes the provision of information and education about the client's disability and how best to support their

progress towards more independent living. It is also the service provider's role to advocate for clients and counter others' discriminatory behavior toward the client.

- Service team members of HF work with and include members of the client's social circle (e.g., significant others and family members) and this includes the provision of information/education to best support the client's rehabilitation (Tsemberis et al., 2012). It is also part of the goal of HF to increase the client's social circle (Tsemberis & Asmussen, 1999).

10. Changing the environment

In addition to interpersonal relationships, the broader social and physical environment should also be conducive to community integration and independent living. These include housing, health care, the social safety net, and human rights pertaining to people living with disabilities. The goal is to create a community that facilitates social inclusion of people living with a psychiatric disability. Blanch et al. (1988) also argue that PRM outlines the importance of first obtaining housing before service delivery as the skills learned will aid in the maintenance of housing.

- The goal of HF, present in every one of its practices from the provision of housing separate from treatment to multi-disciplinary service teams to assistance with obtaining benefits to its value of client choice, is to facilitate community integration. The founder of HF has also explicitly stated that the model was "founded on the belief that housing is a basic right" (Tsemberis, 1999, p. 228). Consistent with this right, housing provision is the first step in the model and is separated from treatment.

11. No limits on participation

Rehabilitation services under PRM are not time-limited, and anyone living with a psychiatric disability can be enrolled in psychosocial rehabilitation services.

- Housing and supports provided as part of HF are also not time-limited. With regard to eligibility, apart from the requirement of being homeless, anyone living with a mental illness can join the HF program, including those with concurrent complex disorders (e.g., substance use disorders) or past criminal justice involvement (Tsemberis & Asmussen, 1999).

31

<u>12. Work-centred process</u>

Employment, whether full-time or part-time, plays a central role in PRM. As Cnaan et al. (1988) describe, "the assumption is that successful involvement in some type of meaningful work is essential to develop independence and self-esteem as well as social contact with and social recognition from people who are not part of the mental health community" (p. 71). This is also viewed as a necessary part of community integration.

- Supported employment is an evidence-based psychosocial rehabilitation service (Solomon et al., 2011) provided by ACT teams in HF (Greenwood et al., 2013; Stefancic et al., 2013). Vocational specialists support clients in preparing for employment of their choosing including coaching every step of the way. Such coaching continues throughout employment (e.g., feedback while the client is employed; Solomon et al., 2011).

<u>13. Social rather than medical supremacy</u>

There are several differences between the biomedical model and PRM when it comes to psychiatric disability. The biomedical model is based on the process of "diagnosis, treatment, and care" (Cnaan et al., 1988, p. 71), focusing on mental health symptoms of an underlying disease with the use of medication and psychotherapy as its remedies. As previously mentioned, the relationship between the service provider and client under the biomedical model is one of expert and passive patient where the expert makes treatment decisions and the patient is expected to adhere. In contrast, PRM focuses on learning specific and useful abilities, and on the role of social and physical environments on community integration and other client-selected facets of personal wellbeing. Service providers form partnerships with clients toward rehabilitation. PRM is also underpinned by the goals of recovery and self-determination using pragmatic steps in the recovery process. Instead of symptoms of a mental illness, PRM takes a strengths-based approach to the client on their journey to improved social functioning and integration.

- This last principle, as described by Cnaan et al. (1988), is at odds with others' description of PRM (Anthony, 1977; Bachrach, 1992). For example, Bachrach (1992) argues that some psychosocial rehabilitation service providers believe that PRM should be used exclusively for service provision to clients contending that other services (e.g., those guided by a biomedical model) "are

superfluous, if not harmful" (p. 1456). Yet, there are also care providers operating within the traditional domain of psychiatry (i.e., following the biomedical model) that believe PRM should be abandoned due to its "antimedical… orientation" (p. 1456). Bachrach viewed such a divide as dangerous and counterproductive, arguing that there is complementarity between the two approaches and that they are not mutually exclusive. They further argue that believing one of the approaches as the only way is a myth. In discussing the utility of antipsychotic medications for psychosocial rehabilitation, Lamb (1994) argues that "without these medications, community rehabilitation and treatment might not be possible for a large number of long-term severely mentally ill persons" (p. 101). It is Cnaan et al.'s (1988), choice of words for the last principle of PRM –that is, implying social supremacy over medical supremacy – that puts this principle at odds with other psychosocial rehabilitation academics. In summarizing their views about the divide between the fields of psychiatry and psychosocial rehabilitation, Bachrach (1992) argues "that, together, these disciplines hold the key to realizing the promise of deinstitutionalization, which seems largely to have eluded us for the past several decades" (p. 1462). HF incorporates this latter view of the medical and PRM. That is, both are integrated into the ACT and ICM teams. Members of the service teams included in HF must work together and with clients towards rehabilitation.

1.8. Housing First: The research base

HF has been subject to empirical evaluation for over two decades, including at least 4 randomized controlled trials among PEHSMI (Goering et al., 2011; Stefancic & Tsemberis, 2007; Tinland et al., 2013; Tsemberis et al., 2004) and at least two randomized controlled trials among other populations of people experiencing homelessness (Sadowski et al., 2009; Wolitski et al., 2010). The next four sections will outline some of the research findings surrounding HF from randomized controlled trials, including positive, null, and adverse outcomes (summarized in Table 1.3 below), along with some of the existing knowledge gaps. It is important to note that in the case of multi-site studies, site-specific findings are not included unless they used different measures from the cross-site analyses for a given outcome (e.g., administrative vs. self-reported data).

Table 1.3.   Positive, mixed, null, and adverse outcomes associated with Housing First

Outcome	Study
Positive outcome	
Increased housing stability	Aubry et al., 2016 Stergiopoulos et al., 2015 Tsemberis et al., 2004
Increased adherence to antipsychotic medication	Rezansoff et al., 2017
Increased social integration	Gulcur et al., 2007
Reduced days in psychiatric hospitals	Gulcur et al., 2003
Greater choice in housing and services	Greenwood et al., 2005
Reduced money spent on alcohol	Kirst et al., 2015
Mixed outcomes	
Quality of life	Aubry et al., 2016 Stergiopoulos et al., 2015
Emergency department use	Aubry et al., 2016 Russolillo et al., 2014 Stergiopoulos et al., 2015 Tinland et al., 2019
Days in hospital	Aubry et al., 2016 Tinland et al., 2019
Involvement in the criminal justice system	Aubry et al., 2016 Somers, Rezansoff, et al., 2013 Stergiopoulos et al., 2015
Food security	O'Campo et al., 2017
Null outcomes	
Community functioning	Aubry et al., 2016 Stergiopoulos et al., 2015
Psychological integration	Aubry et al., 2016 Gulcur et al., 2007 Stergiopoulos et al., 2015
Physical integration	Aubry et al., 2016 Gulcur et al., 2007 Stergiopoulos et al., 2015
Recovery	Kerman et al., 2019
Hospital admissions	Stergiopoulos et al., 2015 Tinland et al., 2019
Mental health symptoms	Aubry et al., 2016 Greenwood et al., 2005 Stergiopoulos et al., 2015 Tinland et al., 2019

Outcome	Study
Substance use	Aubry et al., 2016
	Padgett et al., 2006
	Somers et al., 2015
	Stergiopoulos et al., 2015
	Tinland et al., 2019
Suicidal ideation and attempts	Aquin et al., 2017
Methadone maintenance treatment adherence	Parpouchi et al., 2018
Unprotected sex	Parpouchi, Moniruzzaman, McCandless, et al., 2016
Adverse outcomes	
Reduced competitive employment	Poremski et al., 2016

1.8.1. Housing First: Positive outcomes

The most consistent finding of research concerning HF among any population of people experiencing homelessness, and specifically when it is compared to treatment as usual (TAU), is increased housing stability. Whether one includes only randomized controlled trials that have been conducted (Baxter et al., 2019; Munthe-Kaas et al., 2018) or also investigations with other study designs (Woodhall-Melnik & Dunn, 2016), systematic reviews and meta-analyses have consistently found HF to be associated with increased time in stable housing and decreased time spent homeless. Moreover, a recently published meta-analysis of randomized controlled trials found that HF was associated with significantly reduced hospitalizations and emergency department visits (Baxter et al., 2019).

In randomized controlled trials specifically among PEHSMI, aside from positive housing stability-related outcomes mentioned above, a variety of other positive outcomes favouring scattered-site HF over TAU have been reported in the peer-reviewed literature. These include significantly increased adherence to antipsychotic medication (Rezansoff et al., 2017), greater social integration (Gulcur et al., 2007), reduced days in psychiatric hospitals (Gulcur et al., 2003), greater choice in housing and services (Greenwood et al., 2005), and reduced money spent on alcohol (Kirst et al., 2015).

Qualitative findings from randomized controlled trials among PEHSMI have also highlighted positive trajectories of recovery following stable housing in HF

(Macnaughton et al., 2016; G. Nelson et al., 2015; Padgett, 2007; Rhenter et al., 2018). Positive experiences during the recovery process for some included greater feelings of safety, autonomy, privacy, and control over one's living environment away from the "social chaos" (Macnaughton et al., 2016, p. 144) of homelessness. Other positive experiences included greater self-worth or esteem, having an opportunity to address personal barriers to life goals, and a re-formation of identity consistent with stability and hope (Macnaughton et al., 2016; G. Nelson et al., 2015; Padgett, 2007; Rhenter et al., 2018). Many of these experiences represent facets of what is commonly called "ontological security", which Padgett (2007) summarizes as including "constancy, control, daily routine, and privacy" (p. 1929). Specific to a multi-site randomized controlled trial of HF in Canada, positive experiences during the recovery process also included learning or re-establishing a connection with Indigenous culture, as well as experiencing greater financial stability via programs like social assistance (Macnaughton et al., 2016). A considerably greater proportion of participants receiving HF in that study reported experiencing positive life changes compared to TAU (61% vs. 28%; G. Nelson et al., 2015).

With regard to costs, scattered-site HF has been associated with considerable cost offsets compared to TAU. For example, cost analysis results from the largest randomized controlled trial of HF that was based in Canada, called At Home/Chez Soi, found that HF with ACT for participants with a higher level of need for support was associated with a cost offset of 69% (mean net cost = $6,311 per person per year; Latimer et al., 2020), while HF with ICM for participants with a moderate level of need for support was associated with a cost offset of 46% (mean net cost = $7,868 per person per year; Latimer et al., 2019). Cost offsets were mostly from publicly funded services such as ambulatory care and shelters. In one case in the U.S., scattered-site HF with ACT costed less than TAU (Gulcur et al., 2003).

1.8.2. Housing First: Mixed, null, or adverse outcomes

Research findings from randomized controlled trials pertaining to other HF outcomes among PEHSMI not mentioned in the preceding subsection have been mixed

(i.e., positive and null findings), null, or adverse. Mixed outcomes of HF include, quality of life (Aubry et al., 2016; Stergiopoulos et al., 2015), emergency department use (Aubry et al., 2016; Russolillo et al., 2014; Stergiopoulos et al., 2015; Tinland et al., 2019), days in hospital (Aubry et al., 2016; Tinland et al., 2019), involvement in the criminal justice system (Aubry et al., 2016; Somers, Rezansoff, et al., 2013; Stergiopoulos et al., 2015), and food security (O'Campo et al., 2017). Null findings of HF include community functioning[1] (Aubry et al., 2016; Stergiopoulos et al., 2015), psychological integration (Aubry et al., 2016; Gulcur et al., 2007; Stergiopoulos et al., 2015), physical integration (Aubry et al., 2016; Gulcur et al., 2007; Stergiopoulos et al., 2015), recovery (measured quantitatively; Kerman et al., 2019), hospital admissions (Stergiopoulos et al., 2015; Tinland et al., 2019), mental health symptoms (Aubry et al., 2016; Greenwood et al., 2005; Stergiopoulos et al., 2015; Tinland et al., 2019), substance use-related variables (Aubry et al., 2016; Padgett et al., 2006; Somers et al., 2015; Stergiopoulos et al., 2015; Tinland et al., 2019), suicidal ideation and attempts (Aquin et al., 2017), methadone maintenance treatment adherence (Parpouchi et al., 2018), and unprotected sex (Parpouchi, Moniruzzaman, McCandless, et al., 2016). With regard to adverse outcomes, HF with ICM has been found to be associated with significantly lower odds of competitive employment relative to TAU (Poremski et al., 2016).

Qualitative findings from randomized controlled trials among PEHSMI have outlined a range of recovery trajectories, which also included adverse experiences. For example, although some people found more meaning or purpose after receiving HF, whether through the development of life goals, work, or new interpersonal relationships, others lacked such meaning and purpose, not knowing what activities to occupy their additional time with (Macnaughton et al., 2016; Rhenter et al., 2018). The question of what to do with one's life after receipt of housing was common among participants. Still, others felt a greater sense of belonging in their communities (Macnaughton et al., 2016; G. Nelson et al., 2015) and discussed active participation in community activities, developing meaningful interpersonal relationships with a variety of community members

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[1] HF participants had significantly greater improvement in community functioning during the first year of follow-up, but this was not the case in the second year (Aubry et al., 2016).

(e.g., HF staff, friends, family, etc.; Macnaughton et al., 2016; G. Nelson et al., 2015; Rhenter et al., 2018), yet others did not feel a sense of belonging (Macnaughton et al., 2016) and some experienced social isolation or loneliness (Macnaughton et al., 2016; G. Nelson et al., 2015; Rhenter et al., 2018). Successful obtainment of employment became a reality for some, but others faced barriers (e.g., health problems or criminal records) and wanted more support (Macnaughton et al., 2016). Addictions (G. Nelson et al., 2015; Rhenter et al., 2018) and repayment of debts (Rhenter et al., 2018) were also reported as impeding recovery. However, it is important to note that when these experiences were quantified for participants of At Home/Chez Soi, a considerably greater proportion of those randomized to TAU experienced negative life changes compared to those randomized to HF (36% vs. 8%; G. Nelson et al., 2015). Nevertheless, some HF recipients had adverse experiences, and some experienced what Rhenter et al. (2018) referred to as the "honeymoon period" (The Program's "Honeymoon Effect" section) at the beginning of receiving housing which then "ends by ceding to alternating period[s] of hope and renunciation" (The Program's "Honeymoon Effect" section).

1.8.3. Risk factors of adverse experiences in Housing First

Although a myriad of studies have investigated outcomes of HF using a variety of study designs, quantitative investigations rarely seek to understand the factors that decrease the likelihood of positive outcomes or increase the risk of adverse experiences in HF. No matter what positive outcomes HF may be associated with on average, there are participants who do not experience those same outcomes. For instance, as mentioned above, studies have consistently shown that HF is associated with greater housing stability. Despite this finding, some experience housing instability even after receiving HF (Kerman et al., 2018; Volk et al., 2016), and based on previous studies, Volk et al. (2016) estimated this to be about 15-20% of participants.

Limited research has examined risk factors of adverse experiences among HF-exclusive participants (i.e., without including a comparison group/condition in analyses; Byrne et al., 2018; Collins et al., 2013; Malone, 2009; Pearson et al., 2009; Volk et al., 2016), and even fewer among specifically PESMI in such housing (Byrne et al., 2018;

Pearson et al., 2009; Volk et al., 2016). In such investigations, outcomes have been housing-related. For example, among people who received HF in the Canadian At Home/Chez Soi study (TAU excluded), and using two separate variable selection approaches, Volk et al. (2016) found that at study baseline, the amount of lifetime homelessness, time spent in jail, and being in the Winnipeg site all significantly increased the risk of housing instability while post-traumatic stress disorder or panic disorder decreased this risk over one year of follow-up. Using non-parametric testing, Pearson et al. (2009) found that women were more likely to leave HF over a 12-month period. Byrne et al. (2018) found that a greater amount of time elapsing between admission to HF and first move-in predicted a higher rate of moves while in the program.

Child and youth homelessness as a risk factor for later housing instability as an adult in Housing First

It is particularly important to understand factors which may impede housing stability in HF. After all, as mentioned earlier, HF was in part designed to address homelessness among PESMI. One particular circumstance that may be associated with poorer housing stability among clients of HF but has not yet been investigated is first experiencing homelessness in childhood or youth. Indeed, researchers have proposed that homelessness earlier in life during sensitive developmental years may have far-reaching consequences into adulthood (Cobb-Clark & Zhu, 2017) and may also contribute to maladjustment (Kilmer et al., 2012). A very limited research base has revealed long-term outcomes of experiencing homelessness in childhood or youth when compared to those who first experienced it as an adult (e.g, Cobb-Clark & Zhu, 2017) or compared to people who did not experience homelessness (e.g., Cronley et al., 2015; Stablein & Appleton, 2013). This research, along with other adverse consequences are discussed further in Chapter 2. Briefly, experiencing homelessness in childhood or youth has been found to be associated with later adverse outcomes as an adult, including crime (Cronley et al., 2015), reduced employment among men (Cobb-Clark & Zhu, 2017), poorer self-rated health, lower formal education, depressive symptoms, and drug and alcohol abuse (Stablein & Appleton, 2013). It is unclear if such a pattern of adverse consequences extends to housing stability in HF .

People experiencing homelessness earlier in life such as in youth may not develop life skills that are necessary for living independently (Crystal, 1986; Forchuk et al., 2013; Helfrich et al., 2006). And despite social services like foster care, many may still fall through the cracks into homelessness (Helfrich et al., 2006). As Helfrich et al. (2006) argue, the survival skills learned while homeless may not transfer to "mainstream roles" (p. 191) in society. Needs of youth experiencing homelessness related to independent living are addressed by PRM (Cnaan et al., 1988), including, but not limited to, employment skills, social support and resources, and treatment for mental illness (Crystal, 1986). Crystal (1986) has pointed out that the term "rehabilitation" (p.16) may be a misnomer for service needs of youth experiencing homelessness, and instead suggests "habilitative" (p. 16) as more appropriate since the former implies skills have already been developed in the past, yet for many youth experiencing homelessness, such skills were never developed previously. It may also be the case that left unaddressed, these life skill needs may persist into adulthood and may be more challenging to facilitate compared to those who first experienced homelessness later in adulthood. Providing support earlier on, before homelessness becomes chronic is also important as other research indicates that even among resilient children newly homeless and youth aged 12-20, their resiliency begins to decline after as little as 6 months (Lee et al., 2011). Resiliency was represented by "13 behaviors indicative of being able to function independently while out of home" (p. 303).

Beyond the life skill needs of children and youth experiencing homelessness that may impede independent living, the social adaptation model also suggests potential reasons why people who experience homelessness in their youth and childhood may have a more difficult time exiting homelessness (G. Johnson & Chamberlain, 2008). G. Johnson and Chamberlain (2008) provide an eloquent synthesis of the social adaptation model, outlining its components and modifying it based on their research findings. Generally, four propositions comprise the model: 1) young people who first become homeless usually lack a sense of belonging (i.e., psychological integration), due to loss of contact with stably housed social connections; forming friendships with other people experiencing homelessness contributes to fulfilling this need; 2) as time passes, people adapt to the subculture of homelessness in different locations (e.g., boarding houses or

other emergency housing), 3) survival strategies learned through this subculture include behaviours like substance use, which can simultaneously serve as a coping strategy and way of "sustain[ing] friendships" (p. 573), but may also make it even more difficult to retain stable housing; 4) the more time that elapses while homeless increases the chances of street homelessness due to depletion of housing options and opportunities, consequently resulting in acceptance of chronic homelessness as a "way of life" (p. 574).

G. Johnson and Chamberlain's (2008) mixed-methods research conducted among 1,677 people experiencing homelessness who had first experienced homelessness before the age of 18, supported the propositions of the social adaptation model, with one caveat: homelessness was not found as an accepted way of life. Rather, "most people try to get out of homelessness if they think the opportunity is available" (p. 575). Addressing the need for a sense of belonging and meaning may be a key factor in leaving homelessness and maintaining housing for those children and youth who experience chronic homelessness that lasts into adulthood. After conducting the aforementioned study, G. Johnson and Chamberlain (2008) concluded that:

> Young people who make the transition to adult homelessness need long-term support when they return to conventional accommodation. They are usually unemployed when they are re-housed and they do not have strong social networks in the housed population. Without a meaningful role to perform and new social networks to engage with, some people find it difficult to disengage from the homeless subculture when it is their primary social network. (p. 578)

These same sentiments have been echoed in qualitative research involving HF participants internationally. As mentioned earlier, a common finding across randomized controlled trials has been some participants' unfulfilled need for a sense of belonging and feelings of social isolation and loneliness following randomization to HF and when moving into a new neighbourhood (Macnaughton et al., 2016; G. Nelson et al., 2015; Rhenter et al., 2018). Some participants have also voiced their concern of having a lack of friends and meaningful activities to occupy their time with following housing (Macnaughton et al., 2016; Rhenter et al., 2018).

Housing First and criminal justice system involvement

Another understudied area pertaining to adverse experiences while in HF is the risk factors of criminal justice system involvement (CJSI). A large proportion of jail and prison inmates have experienced homelessness (Greenberg & Rosenheck, 2008a, 2008b; Martell et al., 1995; Tsai et al., 2014) or mental illness (Baranyi et al., 2019; Fazel & Baillargeon, 2011; Fazel & Danesh, 2002; Fazel et al., 2016; Fazel & Seewald, 2012; Prins, 2014). In the U.S., jails and prisons have different definitions. Jails refer to local detainment facilities that hold people on a shorter-term basis, including people sentenced for less than a year, as well as people who have been remanded in custody or are awaiting trial/sentencing (Bureau of Justice Statistics, n.d.; Fazel & Baillargeon, 2011). Prisons, on the other hand, are federal or state detainment facilities holding people sentenced for longer periods of time (Bureau of Justice Statistics, n.d.). In a study of people incarcerated in jails across the U.S., Greenberg and Rosenheck (2008b) found that about 15% reported experiencing homelessness in the year preceding jail admission, a rate that was about 7.5-11.3-fold higher than the national average. In the same year, Greenberg and Rosenheck (2008a) published findings from a study of people incarcerated in state and federal prisons across the U.S., suggesting a rate of homelessness that was 4-6-fold higher than the national average. Martell et al. (1995) investigated homelessness among people experiencing mental illness and who had committed an offence entering the criminal justice system and forensic mental health system in New York City. They found the prevalence of homelessness to be 40 and 21 times higher than the rate in the general U.S. population (43% vs. ~1%) and among people experiencing mental illness in New York City (43% vs. 2%), respectively. Additionally, in an international systematic review of surveys conducted among people incarcerated, Fazel and Danesh (2002) reported rates of serious mental illness that were up to 10-fold higher than national averages, depending on the specific mental disorder examined. Meta-analyses of international literature have also estimated that for every seven people incarcerated, one had psychosis or depression (Fazel & Danesh, 2002; Fazel & Seewald, 2012).

In light of the studies cited above, it may be unsurprising that homelessness (Constantine et al., 2010; Constantine et al., 2012; Greenberg & Rosenheck, 2014; M.

White et al., 2006; Whittaker et al., 2015) and mental illness (or accessing mental health services; Fazel & Baillargeon, 2011; Kushel et al., 2005) have each been found to be significantly and independently associated with CJSI. Furthermore, homelessness (Fu et al., 2013; Greenberg & Rosenheck, 2008a, 2008b; Hawthorne et al., 2012; Lambdin et al., 2018; Lutze et al., 2014; Metraux & Culhane, 2004; Tsai et al., 2014; Yoshikawa et al., 2007) and mental illness (Baillargeon et al., 2009; Fu et al., 2013; Metraux & Culhane, 2004) have each also been found to be independently associated with criminal justice recidivism or multiple occurrences of involvement. However, other research has challenged the notion that mental illness independently increases the risk of recidivism (Rezansoff et al., 2013), and some have argued that mental illness may not play as strong a role as previous studies have suggested due in part to inappropriate comparison groups used (Draine et al., 2002).

Prior literature also suggests that people who experience both homelessness and serious mental illness exhibit very high rates of CJSI (Desai et al., 2000; Kouyoumdjian et al., 2019; Roy et al., 2014; Roy, Crocker, Nicholls, Latimer, Gozdzik, et al., 2016) compared to their respective national averages (Desai et al., 2000; Kouyoumdjian et al., 2019; Roy et al., 2014; Roy, Crocker, Nicholls, Latimer, Gozdzik, et al., 2016). Rates of recidivism have also been found to be very high in this population (Roy, Crocker, Nicholls, Latimer, & Isaak, 2016; Solomon et al., 1994). In a systematic review, Roy et al. (2014) found that PEHSMI had higher rates of CJSI and criminal behavior, as well as victimization, than individuals living with serious mental illness who were housed. In the same study, lifetime prevalence rates of arrest, conviction, and incarceration specifically were reported to be 62.9-90.0%, 28.1-80.0% (52.0-80.0% if the lowest prevalence estimate was excluded), and 48.0-67.0%, respectively. The authors also found that estimating the difference in prevalence between PEHSMI versus homelessness only was limited by a paucity of studies. However, limited research suggested comparable rates of arrest, conviction, and incarceration between both populations. Martell et al. (1995) found that in a group of people experiencing mental illness who had been referred for a mental health assessment by the criminal and supreme courts in New York City, the rate of violent and non-violent crime was 40 and 27 times higher, respectively, among those experiencing both homelessness and mental illness versus mental illness alone. In

43

Canada, a study conducted in 5 cities found a criminal justice contact prevalence of 45% (occurring in the past 6 months) among PEHSMI (Roy, Crocker, Nicholls, Latimer, Gozdzik, et al., 2016). More recent analyses from the Toronto site of the same study found that 55.8% of participants had interacted with police in the year preceding study enrollment, and this decreased to 51.7% and 43.0% during the first and second follow-up years, respectively (Kouyoumdjian et al., 2019). These rates were several times higher than the general household population and higher than the general household population of people living with a mental illness or substance use disorder (Boyce et al., 2015). Unadjusted analyses further revealed that periods of homelessness or unstable housing increased the odds of police interaction by 47% (Kouyoumdjian et al., 2019).

CJSI itself can have harmful consequences for PESMI. For instance, prison inmates with mental illness are also more likely to experience violence, victimization, self-harm, and suicide (Fazel et al., 2016). Following release, those with mental illness are at increased risk of homelessness (Baillargeon et al., 2010) and premature death (Fazel et al., 2016). In a two-year prospective cohort study conducted among adults experiencing homelessness or precarious housing, To et al. (2016) found that a history of incarceration independently reduced the probability of being housed. Some reasons contributing to homelessness following CJSI, include, but are not limited to, the loss of housing while incarcerated (as a result of income loss; van Laere et al., 2009), subsidized housing policies denying housing to those with specific criminal convictions, and lack of coordination between the criminal justice system and housing providers (Roman & Travis, 2006). Re-establishing mental health treatment and a connection to related services in the community post-release can also be very difficult for PESMI, in part due to limited services within and out of prisons, poor discharge planning, and losing health insurance during incarceration (Baillargeon et al., 2010). Having a criminal record can also adversely affect employment prospects (Poremski et al., 2014).

Researchers have noted a variety of circumstances and factors contributing to the disproportionate involvement of people experiencing homelessness or mental illness in the criminal justice system. Factors directly involving mental health treatment following deinstitutionalization include policies limiting involuntary commitment (Abramson,

1972; Aderibigbe, 1997; Lamb, 1984, 2001; Lamb & Weinberger, 1998, 2013), inadequate mental health aftercare following hospital discharge (Aderibigbe, 1997; Belcher, 1988), inconsistent medication adherence (Belcher, 1988), antisocial tendencies or personality disorder as criminogenic (Roy et al., 2014; Skeem et al., 2011), and the preference of some mental health professionals to not treat those who exhibit inconsistent treatment adherence (Lamb & Weinberger, 2013). Other factors proposed that directly involve the criminal justice system include police attitudes and knowledge regarding serious mental illness and decision-making constraints given limited mental health resources and options (Lamb, 2001; Lamb & Weinberger, 1998; Markowitz, 2011), implementation of "get tough on crime" (Skeem et al., 2011, p. 117) laws, minimum sentencing, and the war on drugs (Baillargeon et al., 2010; Skeem et al., 2011). More generally, societal attitudes concerning punishment of those who offend (Lamb & Weinberger, 1998), and a lack of psychosocial supports and services in the community (e.g., housing, income, and other services etc.; Aderibigbe, 1997; Lamb & Weinberger, 1998, 2013) have also been cited as contributors.

Proposed causal explanations for the disproportionate CJSI of people experiencing homelessness or serious mental illness are explored further in Chapters 3 and 4. Briefly, homelessness may increase CJSI via minor or non-violent crimes stemming from subsistence needs and being detected at higher rates due to visibility (Constantine et al., 2010; P. Fischer, 1988; S. Fischer et al., 2008; Kouyoumdjian et al., 2019; Roy, Crocker, Nicholls, Latimer, & Isaak, 2016; Snow et al., 1989; Tsai et al., 2014). The criminalization of homelessness may also contribute to CJSI (e.g., laws against camping in public areas; Robinson, 2017). Researchers have continued to debate causal factors involved in the disproportionate CJSI of PESMI. The crux of the debate centres on the importance of untreated serious mental illness itself as an independent cause vs. other factors like poverty or impulsivity (Draine et al., 2002; Lamb & Weinberger, 2005; S. Nelson, 2002; Peterson et al., 2010).

HF addresses both housing and mental health treatment, and its effect on CJSI has been investigated; a recent systematic review concluded "…that HF does not, on average, have much, if any, impact on CJI [criminal justice involvement]" (Leclair et al., 2019, p.

527) among PEHSMI. This conclusion was based on five studies that met the review's inclusion criteria (Aubry et al., 2016; Kriegel et al., 2016; Stergiopoulos et al., 2015; Tsai et al., 2010; Whittaker et al., 2016). Three of these studies (Kriegel et al., 2016; Tsai et al., 2010; Whittaker et al., 2016) reported significant and favourable results for HF but included comparison groups that involved other HF models or a different housing and support intervention (residential treatment first). These three latter studies, however, were not randomized, had a higher risk of bias, and were interpreted as reflecting a regression to the mean by the review's authors, contributing to their overall null conclusion. The two remaining studies included in the review were from the multi-site At Home/Chez Soi study that investigated the impact of HF on self-reported number of arrests compared with TAU. Both studies reported null findings (Aubry et al., 2016; Stergiopoulos et al., 2015). Importantly, however, the review did not include a study published in 2013 from the Vancouver site of that same experimental trial that reported a significantly lower rate of criminal convictions independently associated with HF when compared to TAU (Somers, Rezansoff, et al., 2013). The findings of that study in particular are important because it is the only study in the peer-reviewed literature to examine the effect of HF on a CJSI outcome among PEHSMI using a randomized controlled trial, administrative data, and an adjusted model.

Despite the potential of HF to reduce the rate of CJSI on average, some clients may still become involved. The factors associated with such involvement after enrollment in HF have not been investigated. Moreover, the existing studies of correlates of CJSI among PEHSMI suffer from several key limitations: all were either cross-sectional or included longitudinal data of ≤2 years (Barrett et al., 2009; Brunette & Drake, 1998; Calsyn et al., 2005; Desai et al., 2000; Edalati et al., 2020; Gelberg et al., 1988; Kouyoumdjian et al., 2019; McGuire & Rosenheck, 2004; Mitchell et al., 2017; Roy, Crocker, Nicholls, Latimer, Gozdzik, et al., 2016; Roy, Crocker, Nicholls, Latimer, & Isaak, 2016; Solomon et al., 1994; Topolovec-Vranic et al., 2017; Wenzel et al., 1996), and most have been conducted in the U.S. (Barrett et al., 2009; Brunette & Drake, 1998; Calsyn et al., 2005; Desai et al., 2000; Gelberg et al., 1988; McGuire & Rosenheck, 2004; Mitchell et al., 2017; Solomon et al., 1994; Wenzel et al., 1996). Of greater concern is

that the vast majority have been based on self-reported criminal justice variables (Brunette & Drake, 1998; Desai et al., 2000; Edalati et al., 2020; Gelberg et al., 1988; McGuire & Rosenheck, 2004; Mitchell et al., 2017; Roy, Crocker, Nicholls, Latimer, Gozdzik, et al., 2016; Roy, Crocker, Nicholls, Latimer, & Isaak, 2016; Topolovec-Vranic et al., 2017; Wenzel et al., 1996). Based on a systematic review published in 2014 (Roy et al., 2014), as well as the author's knowledge of studies published after this date, only one of the studies of those conducted in Canada did not use self-reported criminal justice data (Kouyoumdjian et al., 2019). The study examined police interactions using a local police service database and an unadjusted, univariate analysis.

1.9. Study significance, aims, and objectives

HF has emerged as a very effective solution to ending chronic homelessness and several other outcomes, but some clients of the program require additional support. As HF continues to be implemented globally, and in some cases adopted by national governments (e.g., Government of Canada, 2019; United States Interagency Council on Homelessness (USICH), 2018), it is important to identify factors associated with adverse experiences while in the program in order to understand additional needs of clients and to reduce the incidence of these experiences. The aim of this thesis is to understand factors associated with adverse experiences while in HF, specifically housing instability and CJSI, in order to contribute to a better understanding of the additional support needs of clients to ultimately improve HF programs and inform housing policy. Due to limitations of existing studies investigating factors associated with CJSI mentioned above, an additional aim of this thesis is to understand these factors among PEHSMI not enrolled in HF in order to inform variable selection and public policy. Data pertaining to PEHSMI recruited to two randomized controlled trials of HF in Metro Vancouver are used for the following three study objectives:

1. To estimate the effect of first experiencing homelessness in childhood or youth on housing stability as an adult in HF.

2. To examine factors associated with criminal convictions over a five-year period preceding study baseline.

47

3. To investigate baseline factors associated with criminal convictions following receipt of HF.

There are five chapters in this thesis. The introductory chapter provides a historical account of homelessness and mental health services beginning in the 19th century, as well as a description of and research on HF. Chapters 2-4 describe original investigations corresponding to each of the three objectives of this thesis. Chapter 5 provides concluding remarks, including a summary of the three investigations of this thesis, implications for HF programs and public policies, and suggestions for future research.

1.10. References

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Chapter 2.

The Association Between Experiencing Homelessness in Childhood or Youth and Adult Housing Stability in Housing First

2.1. Abstract

Background: Researchers have pointed out the paucity of research investigating long-term consequences of experiencing homelessness in childhood or youth. Limited research has indicated that the experience of homelessness in childhood or youth is associated with adverse adjustment-related consequences in adulthood. Housing First has acknowledged effectiveness in improving housing outcomes among adults experiencing homelessness and living with serious mental illness, although some Housing First clients struggle with maintaining housing. The current study was conducted to examine whether the experience of homelessness in childhood or youth increases the odds of poorer housing stability following entry into high-fidelity Housing First among adults experiencing serious mental illness and who were formerly homeless.

Methods: Data were drawn from the active intervention arms of a Housing First randomized controlled trial in Metro Vancouver, Canada. Participants (n = 297) were referred to the study from service agencies serving adults experiencing homelessness and mental illness between October 2009 and June 2011. The Residential Time-Line Follow-Back Inventory was used to measure housing stability. Least absolute shrinkage and selection operator was used to estimate the impact of first experiencing homelessness in childhood or youth on later housing stability as an adult in Housing First.

Results: Analyses indicated that homelessness in childhood or youth was negatively associated with experiencing housing stability as an adult in Housing First (aOR = 0.52; 95% CI: 0.30-0.89).

Conclusions: Further supports are needed within Housing First to increase housing stability among adult clients who have experienced homelessness in childhood or youth.

Asking clients about the age they first experienced homelessness may be of clinical utility upon enrollment in Housing First and may help identify support needs related to developmental experiences. Results further emphasize the importance of intervening earlier in life in childhood and youth before experiencing homelessness or before it becomes chronic. Findings also contribute to a limited knowledge base regarding the adverse long-term consequences of childhood and youth homelessness.

Trial registration: Current Controlled Trials: ISRCTN57595077 and ISRCTN66721740. Registered on October 9, 2012.

Milad Parpouchi contributed to study conception and design, data collection, data analysis and interpretation, the development of hypotheses, and wrote this chapter.

2.2. Introduction

Homelessness has become a public health crisis in North America. In Canada, it has been estimated that 235,000 people experience homelessness each year, with 35,000 people experiencing it each night (Gaetz et al., 2016); about 20% are unaccompanied youth ages 13-24, equating to approximately 35,000-40,000 people. A national point-in-time homeless count in the U.S. found about 553,000 people experiencing homelessness in 2018, and nearly seven percent were unaccompanied youth under the age of 25, equating to approximately 36,000 people (Henry et al., 2018). Furthermore, over 1.35 million children enrolled in elementary and secondary public schools in the 2016-2017 school year were reported as homeless in the U.S. alone (National Center for Homeless Education, 2019). About 2.5 million children under the age of 18 are estimated to be experiencing homelessness on an annual basis in the U.S. (Bassuk, DeCandia, Anne Beach, & Berman, 2014).

Homelessness has increased since the 1980s in many Western countries, and demographic changes have accompanied this increase within the population (Crane & Warnes, 2010; Gaetz et al., 2016; Grant et al., 2013). As one example, in Canada, a greater proportion of people experiencing homelessness are youth than was the case prior to the 1980s (Gaetz et al., 2016). Furthermore, families and children among people

experiencing homelessness are increasing at the highest rate (Raising the Roof, 2016). In the U.S., families with children now comprise one-third of people experiencing homelessness (Henry et al., 2018), and this figure has also grown since the 1980s (Grant et al., 2013).

Youth experiencing homelessness may develop skills necessary to live on the streets (Helfrich et al., 2006), but may not have yet had opportunities to develop the life skills necessary for living independently (Forchuk et al., 2013; Helfrich et al., 2006). Additionally, researchers have hypothesized that experiencing homelessness earlier in life, during sensitive developmental years, may have more harmful consequences later in life (Cobb-Clark & Zhu, 2017). Kilmer and colleagues have argued that the stressors involved in the experience of homelessness during childhood may increase "the likelihood that youngsters will evidence difficulties as they move along their adjustment trajectories" (Kilmer et al., 2012, p. 391). Similar arguments have been made regarding development for those experiencing homelessness in youth (Edidin et al., 2012).

Numerous studies have found that homelessness during childhood or youth is associated with a myriad of health and social problems, including, infectious disease, chronic physical health conditions, poor nutrition, dental disease, mental illness, substance use, injury, mortality, poorer cognitive functioning and academic performance, behavioral health risks, and violence (Edidin et al., 2012; Gultekin et al., 2019; Kulik et al., 2011). A systematic review of studies using "full psychiatric diagnostic interview[s]" (Hodgson et al., 2013, p. e3) found the prevalence of psychiatric disorders among youth experiencing homelessness to be between 48-98%. Moreover, the experience of homelessness as a very young child may also be associated with adverse consequences, such as developmental delays. For example, one study found that infants and children aged 2 months to 6 years experiencing homelessness had developmental scores at levels significantly poorer than the general population, with the most pronounced differences in the domains of language and communication (Haskett et al., 2016).

Findings from some longitudinal studies suggest that experiencing homelessness earlier in life may be independently and significantly associated with adverse

consequences later in life. For example, a longitudinal study among participants aged 18-26 found that the experience of homelessness before the age of 26 was independently and significantly associated with an increased likelihood of committing a violent or property crime later in adulthood (Cronley et al., 2015). Similarly, using panel data among a representative stratified sample of people in Australia at least 15 years of age who had experienced homelessness or were at risk, Cobb-Clark and Zhu (2017) found that the experience of homelessness first in childhood (≤15 years of age) among men aged 21-54 years in the study was significantly associated with a decreased likelihood of employment in adulthood in their adjusted model, compared to men who had first experienced homelessness later in their life. When potential mediating variables were considered, there was still a direct effect. Using eight-year follow-up data from the National Longitudinal Survey of Youth-Child Study, Stablein and Appleton (2013) compared the health of adolescents and young adults who were formerly homeless (ages 15-25) to those who had not experienced homelessness. They found that the experience of homelessness (occurring any time between 2000 and 2006) was significantly associated with having an incident case of asthma, a health-limiting condition, and developing poorer self-rated health following homelessness at the final follow-up (2008). The relationship between homelessness and asthma and having a health-limiting condition was partly mediated by other variables, but the relationship with self-rated health remained independent. The experience of homelessness was also independently and significantly associated with lower education attainment, an increased risk of depressive symptoms, and alcohol and substance abuse following homelessness. A cross-sectional study conducted in Canada similarly found that the earlier the age of first experiencing homelessness, the higher the likelihood of being in high psychological distress among youth accessing services for people experiencing homelessness (Kidd et al., 2017).

In light of the above longitudinal studies reporting adverse long-term consequences of childhood and youth homelessness, it may be the case that once an adult, people may have difficulty adjusting to housing and support interventions. One such intervention may be Housing First (HF).

HF is a supported housing model that brings together permanent housing and health and social services for people experiencing homelessness and serious mental illness (Tsemberis, 1999; Tsemberis & Asmussen, 1999). Based on the psychosocial rehabilitation model (Cnaan et al., 1988; Tsemberis, 2013), clients of HF are provided choice and can decide what, if any, services to engage in while in the program (e.g., mental health treatment; Tsemberis et al., 2004). Such choice is also extended to substance use, as there are no programmatic requirements regarding abstinence (Tsemberis & Asmussen, 1999).

Since its establishment in New York City (Tsemberis & Asmussen, 1999), HF has been implemented in many parts of the globe, including, but not limited to, Canada (Government of Canada, 2019), Australia (Whittaker et al., 2015), and Europe (Greenwood et al., 2013). Systematic reviews have consistently found HF to be associated with increased housing stability outcomes (Aubry et al., 2015; Baxter et al., 2019; Boland et al., 2018; Woodhall-Melnik & Dunn, 2016). In a recent review of tenancy sustainment following homelessness, Boland et al. (2018), concluded "that Housing First is the most promising intervention" (p. e6).

What is less often discussed in the literature is the proportion of people for whom HF does not help to maintain housing stability. Volk et al. (2016) noticed a trend in the literature; about 15-20% of participants in HF studies exhibit housing instability. A few studies have quantitatively investigated factors associated with housing instability, retention, or relocations within HF (Adair et al., 2017; Byrne et al., 2018; S. Collins et al., 2013; Malone, 2009; Pearson et al., 2009; Volk et al., 2016), however, to our knowledge, no studies have reported the association between first experiencing homelessness in childhood or youth and subsequent housing stability in adulthood within HF. Adair et al. (2017) included the age of first experiencing homelessness as a predictor in their modelling approach, but results were not reported for this specific variable. More broadly, other researchers have pointed out the paucity of research investigating long-term consequences of experiencing homelessness in childhood or youth (Cobb-Clark & Zhu, 2017).

The objective of the current study was to examine the association between having first experienced homelessness in childhood or youth and housing stability following the implementation of high-fidelity HF among adults experiencing homelessness or precarious housing and living with serious mental illness. We hypothesized that the experience of homelessness in childhood or youth would be significantly and independently associated with poorer housing stability after receiving HF as an adult. Such research is important to: 1) contribute to the understanding of risk for poorer housing stability after receiving HF 2) improve policies and practices related to the intervention, and 3) add to the limited literature regarding long-term consequences of childhood and youth homelessness.

2.3. Methods

2.3.1. Data source, participant recruitment, and study procedures

The present study is based on a larger experimental investigation called Vancouver At Home (VAH), which included two pragmatic randomized controlled field trials involving two years of follow-up (Current Controlled Trials: ISRCTN57595077 and ISRCTN66721740). The trials examined HF in congregate and scattered-site configurations among adults experiencing homelessness or precarious housing and living with serious mental illness (n=497) in Metro Vancouver, British Columbia, Canada. Interventions were compared to treatment as usual (TAU). The protocol for VAH has been published (Somers et al., 2013).

Participants were referred to the study from service agencies serving adults experiencing homelessness and mental illness (e.g., homeless shelters) in Metro Vancouver, Canada between October 2009 and June 2011. Study eligibility included: being a Canadian citizen, at least 19 years of age, absolutely homeless or precariously housed, and having a serious mental illness (assessed by the Mini International Neuropsychiatric Interview [MINI]; Sheehan et al., 1998). VAH considered participants with "no fixed place to sleep or live for more than 7 nights [in the past week] and little likelihood of obtaining accommodation in the coming month" (Somers et al., 2013, p. 3)

as absolutely homeless. Participants "currently residing in marginal accommodation, such as a SRO [single-room occupancy] hotel, and having two or more episodes of [absolute] homelessness (as defined above) during the past 12 months" (Somers et al., 2013, p. 3) were considered precariously housed. Written informed consent was provided by participants.

Once enrolled in the study, a range of interviewer-administered questionnaires were used to elicit information from participants at baseline, including, but not limited to, socio-demographics, service use, mental disorders and symptoms, community functioning, physical comorbidities, and substance use. Data collected during the baseline interview were also used to determine participant support need levels. A comprehensive assessment algorithm was used to differentiate participants with "high needs" from "moderate needs". Criteria determining participants with high needs included the presence of a psychotic disorder or bipolar disorder (according to the MINI; Sheehan et al., 1998), receiving a score of ≤62 on the Multnomah Community Ability Scale (Barker et al., 1994), and one of the following: having a history of arrest or incarceration in the past six months, two or more psychiatric hospitalizations in one of the past five years (365-day period), or substance dependence (according to the MINI; Sheehan et al., 1998). All other participants were considered as having moderate needs. Additional information about VAH, such as sampling and questionnaires used, have been published (see Somers et al., 2013). The study underwent ethics review and was approved by the Research Ethics Board of Simon Fraser University.

2.3.2. Interventions

The two VAH randomized controlled trials were differentiated based on participant need levels (i.e., moderate vs. high needs). The randomized controlled trial for those with moderate needs randomly allocated participants to either scattered-site HF with intensive case management (HF-ICM) or TAU (comprised of existing services in the community). The randomized controlled trial for those with high needs randomly allocated participants to scattered-site HF with assertive community treatment (HF-ACT),

congregate HF with on-site support (CONG), or TAU. A description of each HF intervention follows.

The HF-ICM intervention included a private rental apartment of the participant's choice in Metro Vancouver combined with intensive case management whereby case managers helped participants access existing community services and were available 12 hours a day. HF-ACT included the same housing as HF-ICM, but the support service component included a multi-disciplinary health and social service provider team located in the community and available 24/7. The CONG intervention involved a single building all occupied by study participants. Participants were provided an independent room and bathroom, but other spaces were shared with tenants (e.g., kitchen). The support component of CONG involved on-site health and social services available 24/7. Moreover, a range of recreational and volunteer activities were provided as part of the intervention. Somers et al. (2013) have published additional information on interventions and randomization procedures. We only included participants randomized to intervention arms (i.e., HF-ICM, HF-ACT, or CONG) in the current study.

2.3.3. Variables of interest

The main outcome was housing stability and was measured using the Residential Time-Line Follow-Back Inventory every three months (Tsemberis et al., 2007). Validity of the Residential Time-Line Follow-Back Inventory has been demonstrated among people experiencing homelessness and serious mental illness, with administrative data from agencies providing housing and support used as the reference comparison (Tsemberis et al., 2007). Stable housing in VAH was defined as having tenancy rights or living in one's own apartment/room/house/family for an expected time of at least 6 months (Somers et al., 2017). Unstable housing was defined as living on the streets or in temporary accommodations, including, but not limited to shelters, hospitals, and crisis units. For the present study, we operationalized housing stability as participants spending ≥90% of days in stable housing during the 2-year follow-up period. Participants spending <90% of days in stable housing were considered unstably housed. Researchers have argued that definitions of housing stability in the literature are widely inconsistent (e.g.,

Tsemberis et al., 2007; Volk et al., 2016). The ideal purpose of HF is to eliminate homelessness and facilitate stable housing, however, as Pearson et al. (2009) argue, "housing stability in Housing First programs is an iterative process [and] temporary departures from housing are not uncommon… These episodic departures are part of a stabilizing strategy to ensure that clients maintain their engagement in housing and treatment" (p. 415). Given that HF clients are among the most vulnerable and marginalized of people experiencing homelessness and that temporary exits from the program may be part of the journey to recovery, we decided on 90% as the stable housing cut-off.

The primary independent variable was age of first experiencing homelessness and was asked during the study's baseline interview. Youth have been commonly defined as up to the age of 24 or 25 (e.g., Dempsey & Harrison, 1998; Kozloff et al., 2016; Kulik et al., 2011; United Nations, n.d.). The United Nations (n.d.) defines youth as 15-24 years of age and children as below this age (<14 years of age). Because we were interested in the experience of homelessness in childhood or youth, we operationalized our primary independent variable as age of first experiencing homelessness and dichotomized it as <25 years vs. ≥25 years.

Intervention type and other relevant variables collected at baseline were included per prior literature as control covariates. Apart from the type of HF intervention variable (HF-ICM, HF-ACT, CONG), socio-demographic variables included age at randomization (<25 years, 25-44 years, >44 years), gender (woman, man), ethnicity (Indigenous, White, Other), education (less than high school, high school or higher), and marital status (single and never married, other). Homelessness variables included lifetime duration of homelessness (≤ 36 months, >36 months), longest episode of homelessness (≤12 months, >12 months), and housing status at enrollment (absolutely homeless, precariously housed). Mental illness variables included mental health symptom severity (Colorado Symptom Index score; higher scores indicate greater symptom severity; Boothroyd & Chen, 2008), the less severe cluster of mental disorders (yes/no; includes at least one of: major depressive episode, panic disorder, or post-traumatic stress disorder according to the MINI; Sheehan et al., 1998), and the severe cluster of mental disorders (yes/no;

82

includes at least one of: psychotic disorder, mood disorder with psychotic features, or manic or hypomanic episode according to the MINI; Sheehan et al., 1998). Learning disability variables included perceiving having had a learning disability in childhood (yes/no) and having been told of having a learning disability in childhood (yes/no). Community functioning was determined by the Multnomah Community Ability Scale score (interviewer-rated; higher scores indicate greater community functioning; Barker et al., 1994). Substance use behaviours and income related to sex work in the month preceding baseline were asked from the Maudsley Addiction Profile (Marsden et al., 1998) and included use of alcohol (yes/no), heroin (yes/no), illicit methadone (yes/no), benzodiazepines (yes/no), cocaine (yes/no), crack (yes/no), amphetamine (yes/no), cannabis (yes/no), injection of drugs (yes/no), daily substance use (yes/no; including alcohol), daily drug use (yes/no; excluding alcohol), daily hard drug use (yes/no; excluding alcohol and cannabis), and sex work-related income (yes/no). Money spent on alcohol (yes/no; in Canadian dollars) and money spent on drugs (yes/no; in Canadian dollars) were asked from the Global Assessment of Individual Need (Substance Problem Scale; Dennis et al., 2006). Information related to all questionnaires administered in VAH have been published (Somers et al., 2013). All VAH questionnaires were interviewer-administered in person.

2.3.4. Statistical analysis

Means and standard deviations were presented for continuous variables, and percentages were presented for categorical variables. Least absolute shrinkage and selection operator (LASSO) was used to model the primary independent variable of interest (i.e., age of first experiencing homelessness) and housing stability. LASSO is a regression analysis method which is used in selecting and fitting variables for a statistical model with a large set of potential covariates (Hastie et al., 2015). It uses a modern data driven method that selects only a subset of the provided variables for the model and tests them in other datasets in order to improve the prediction accuracy and interpretability of regression models. Moreover, LASSO can be used to make inference about the variable of interest in the presence of many potential control covariates (Belloni et al., 2014; Drukker, 2019). Among LASSO, the cross-fit partialing-out method was specified. This

method, which is also known as Double Machine Learning, has a better finite sample property and is more robust, due to the cross-fit nature (coefficients are obtained from one sample and used in another, and this procedure is repeated several times) and split sample technique (Chernozhukov et al., 2018; Drukker, 2019). In the current analysis, the effect (odds ratio) of the age in which participants first experienced homelessness on housing stability was estimated using binary logistic regression. In the LASSO model, age of first experiencing homelessness was used as the primary independent variable of interest and all other variables (e.g., age, gender, ethnicity, etc.) and their interaction terms were used as controlling covariates. P-values less than 0.05 were considered significant. Missing values were low (<1.5%) – with the exception of the use of cannabis variable (this variable was added after study recruitment had begun; 9.4% missing) – and were replaced by median values for continuous variables and by largest group for categorical variables. For the outcome, housing stability, the last observation was carried forward in the event of missing data. Stata 16 (StataCorp, 2019) was used to conduct these analyses.

The follow-up period included the date of randomization until the last available follow-up interview. Follow-up intervals for participants began and stopped at different times, and follow-up rates are shown in Somers et al. (2013).

2.4. Results

Overall, 497 participants were enrolled into VAH. Of these participants, 297 (60%) were randomized to HF intervention arms, including 100 to HF-ICM, 90 to HF-ACT, and 107 to CONG. Figure 2.1 presents the flow of participants.
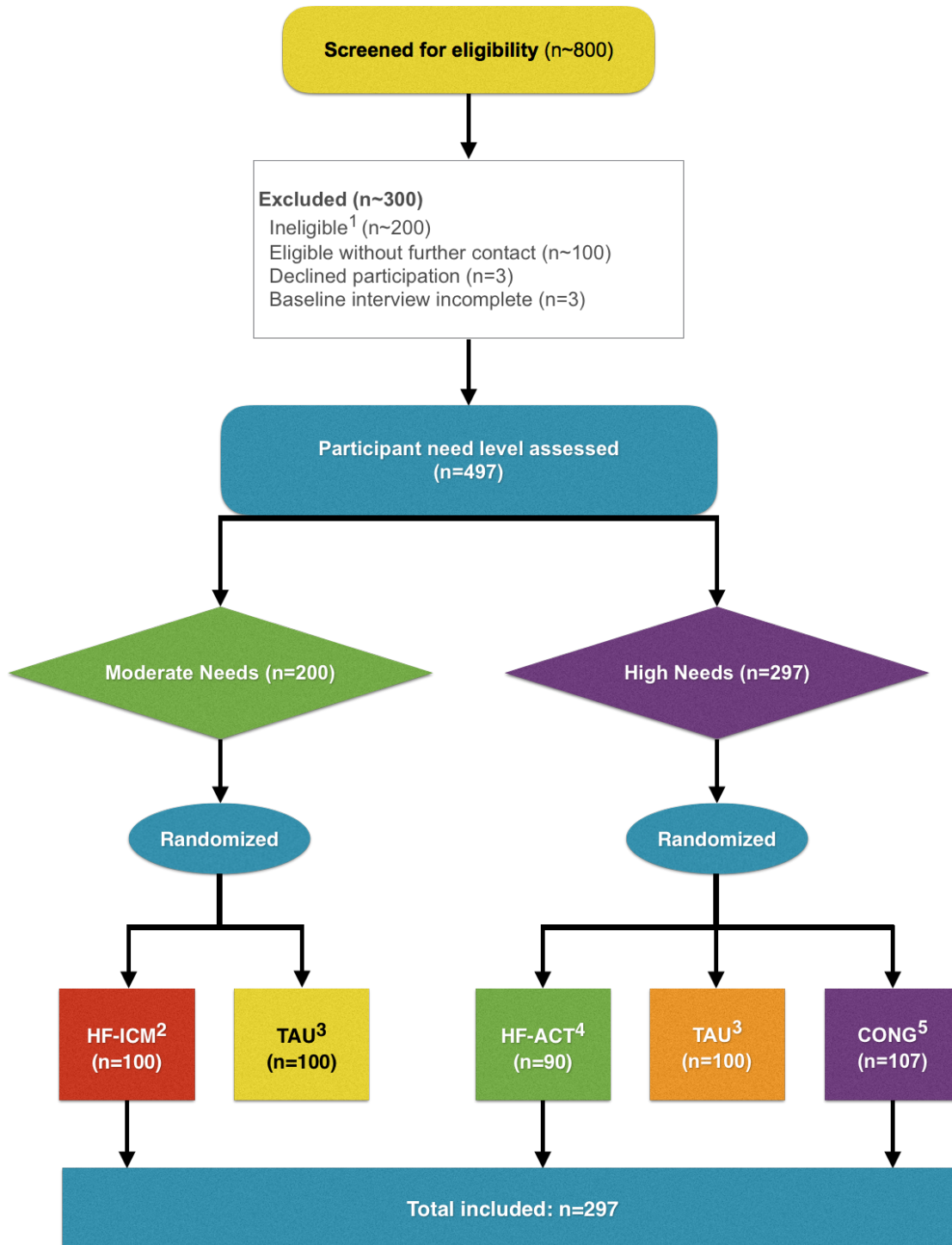
Figure 2.1.   Flow of participants

1. About 100 participants were ineligible after telephone screening, and 94 participants after in-person screening.
2. HF-ICM: Housing First with intensive case management
3. TAU: Treatment as usual
4. HF-ACT: Housing First with assertive community treatment
5. CONG: Congregate Housing First with on-site support

About 44% of participants reported first experiencing homelessness before the age of 25. Results for additional variables collected at baseline are listed in Table 2.1.

Table 2.1.   Characteristics of Vancouver At Home participants randomized to Housing First (n=297)

Variable	n (%) / mean (SD)
Socio-demographics, n (%)	
Age at randomization	
<25 years	22 (7.4)
25-44 years	171 (57.6)
>44 years	104 (35.0)
Gender	
Woman	77 (26.0)
Man	219 (74.0)
Ethnicity	
Indigenous	51 (17.2)
White	173 (58.2)
Other	73 (24.6)
Education	
Less than high school	173 (58.8)
High school or higher	121 (41.2)
Marital Status	
Single (never married)	205 (69.5)
Other	90 (30.5)
Homelessness, n (%)	
Age of first homeless	
< 25 years	128 (43.7)
≥ 25 years	165 (56.3)
Lifetime duration of homelessness	
≤ 36 months	145 (49.5)
> 36 months	148 (50.5)
Longest episode of homelessness	
≤ 12 months	141 (48.1)
> 12 months	152 (51.9)
Housing status (at enrollment)	
Absolutely homeless	232 (78.1)
Precariously housed	65 (21.9)
Mental illness, learning disability, and community functioning	
Mental health symptom severity (Colorado Symptom Index score)	
Mean (SD)	36.6 (12.8)
Less severe cluster of mental disorders, n (%)	
No	147 (49.5)
Yes	150 (50.5)

Variable	n (%) / mean (SD)
Severe cluster of mental disorders, n (%)	
No	75 (25.2)
Yes	222 (74.8)
Learning disability in childhood (you perceived), n (%)	
No	190 (64.0)
Yes	107 (36.0)
Learning disability in childhood (someone told you), n (%)	
No	191 (64.3)
Yes	106 (35.7)
Community functioning (Multnomah Community Ability Scale score)	
Mean (SD)	55.2 (9.5)
Substance use (past month)	
Use of alcohol, n (%)	
No	164 (55.6)
Yes	131 (44.4)
Use of heroin, n (%)	
No	240 (81.4)
Yes	55 (18.6)
Use of illicit methadone, n (%)	
No	283 (95.9)
Yes	12 (4.1)
Use of benzodiazepines, n (%)	
No	268 (91.2)
Yes	26 (8.8)
Use of cocaine, n (%)	
No	245 (83.1)
Yes	50 (16.9)
Use of crack, n (%)	
No	197 (66.8)
Yes	98 (33.2)
Use of amphetamine, n (%)	
No	254 (86.7)
Yes	39 (13.3)
Use of cannabis, n (%)	
No	148 (55.0)
Yes	121 (45.0)
Injected drugs, n (%)	
No	239 (81.6)
Yes	54 (18.4)
Daily substance use (including alcohol), n (%)	
No	211 (71.5)
Yes	84 (28.5)

Variable	n (%) / mean (SD)
Daily drug use (excluding alcohol), n (%) No Yes	 218 (73.9) 77 (26.1)
Daily hard drug use (excluding alcohol & cannabis), n (%) No Yes	 251 (85.1) 44 (14.9)
Money spent on alcohol (Canadian dollars) Mean (SD)	 60.0 (164.5)
Money spent on drugs (Canadian dollars) Mean (SD)	 331.3 (852.9)
Other, n (%)	
Sex work-related income (past month) No Yes	 282 (94.9) 15 (5.1)
Type of Housing First intervention Housing First with intensive case management Housing First with assertive community treatment Congregate housing with on-site support	 100 (33.7) 90 (30.3) 107 (36.0)

Housing stability outcomes are listed in Table 2.2. Overall housing stability was 0.73 (SD = 0.27) and was similar by HF intervention, including 0.72 (SD = 0.30) for HF-ICM, 0.74 (SD = 0.25) for HF-ACT, and 0.74 (SD = 0.26) for CONG. About 40% of participants spent ≥ 90% of days in stable housing during the two years of follow-up, including 44% of participants in HF-ICM, about 36% in HF-ACT, and about 39% in CONG.

Table 2.2. **Housing stability among Vancouver At Home participants by Housing First intervention (n=297)**

Variable	Overall	HF-ICM (n=100)	HF-ACT (n=90)	CONG (n=107)
Housing Stability Mean (SD)	 0.73 (0.27)	 0.72 (0.30)	 0.74 (0.25)	 0.74 (0.26)
Housing Stability, n (%) < 90% of days ≥ 90% of days	 179 (60.3) 118 (39.7)	 56 (56.0) 44 (44.0)	 58 (64.4) 32 (35.6)	 65 (60.8) 42 (39.3)

HF-ICM: Housing First with intensive case management; HF-ACT: Housing First with assertive community treatment; CONG: Congregate Housing First with on-site support

Table 2.3 presents results from the unadjusted and adjusted LASSO analyses. Prior to adjustment with control variables, participants who experienced homelessness <25 years of age had half the odds of spending ≥ 90% of days in stable housing (uOR = 0.50; 95% CI = 0.31-0.81). This result remained statistically significant following adjustment with control variables (aOR = 0.52; 95% CI = 0.30-0.89).

Table 2.3. **Least absolute shrinkage and selection operator analyses of the effect of first experiencing homelessness in childhood or youth (<25 years) on housing stability (≥90%) among Vancouver At Home participants randomized to Housing First (n=297)**

Variable	Unadjusted Odds Ratio (95% CI)	P value	Adjusted Odds Ratio (95% CI)	P value
Age of first homeless < 25 years ≥ 25 years	**0.50 (0.31, 0.81)** Reference	**0.005**	**0.52 (0.30, 0.89)** Reference	**0.017**

2.5. Discussion

Consistent with our hypothesis, the experience of homelessness in childhood or youth was significantly and independently associated with lower odds of experiencing housing stability in HF. More specifically, compared to participants who had first experienced homelessness at age 25 or older, participants who had first experienced homelessness under the age of 25 had half the odds of experiencing housing stability as an adult in HF over 24 months.

This finding adds to limited research demonstrating long-term consequences of homelessness for children and youths (Cobb-Clark & Zhu, 2017; Cronley et al., 2015) and underscores the additional support needs of participants in HF. It has been suggested that exposure to and integration into "homeless subculture" (Johnson & Chamberlain, 2008, p. 578) in childhood or youth via street survival skills, and friendships developed with other people experiencing homelessness and the subsequent "camaraderie" (Johnson & Chamberlain, 2008, p. 576) make it more difficult to exit homelessness. As Johnson and Chamberlain (2008) argue, "without a meaningful role to perform and new social networks to engage with, some people find it difficult to disengage from the homeless subculture when it is their primary social network" (p. 578). These findings are supported

by qualitative analyses of VAH outlining lack of meaningful activity and work, boredom, and social isolation following randomization to HF, albeit these data were not broken down by age of first experiencing homelessness (Patterson et al., 2015).

Additionally, studies from the psychosocial rehabilitation and occupational therapy literature dating back as far as the 1980s (Crystal, 1986; Helfrich et al., 2006) outlined a range of barriers youth experiencing homelessness faced to independent living, including, but not limited to, unemployment and lack of employment skills, educational deficits, mental health problems, problematic substance use, inadequate social support, and family problems (Crystal, 1986). Helfrich et al. (2006) further argue that youth experiencing homelessness "have limited opportunities to develop life skills that promote mainstream roles such as that of student, family member or worker" (p. 191). These same skill deficits may persist into adulthood without adequate supports. Participants who had experienced homelessness in childhood or youth may have had a more difficult time developing these skills while in VAH HF interventions. Findings of the present study warrant replication and may expose an important area of further research examining the consequences of developmental experiences as they contribute to housing stability.

Research is also needed to determine what modifications and additional support services are needed within HF interventions to increase housing stability for adults who first experienced homelessness in childhood or youth, but two additional implications can also be drawn from the present study: 1) our analyses suggest that gathering information about age of first experiencing homelessness may be of clinical utility upon enrollment in HF, and may help identify support needs related to developmental challenges and experiences, and 2) it is vital to implement housing and support interventions targeting children and youth with or without family members before they become homeless or immediately after becoming so. Other researchers have called for HF as a potential solution among youth experiencing homelessness (Lee et al., 2011).

A multisite, experimental investigation, which included VAH as one of its sites, previously found HF to be associated with significantly improved housing stability compared to TAU among youth ages 18-24 living with serious mental illness (Kozloff et

al., 2016). Results were similar when compared to those older than 24 years of age. However, secondary and exploratory outcomes of the same study were not as promising, with HF even being associated with significantly decreased rates of employment relative to TAU. Differences in needs between youth and adults have led to adaptations of HF specifically for youth (Gaetz, 2014, 2017). However, there is a paucity of research examining HF among youth experiencing homelessness (Gaetz, 2014), and existing research on youth experiencing both homelessness and serious mental illness has found that some do not prefer to live independently due to isolation, continued substance use challenges, and potential cultural-related factors, such as leaving one's existing social circle (Forchuk et al., 2013). Further research is needed to clarify modifications to HF that best support housing stability for youth experiencing homelessness.

There also exists extremely limited research in the area of housing and support interventions for children in families experiencing homelessness. Limited research suggests HF, permanent supportive housing, and housing subsidies or affordable housing are effective in improving housing status (Bassuk, DeCandia, Tsertsvadze, & Richard, 2014; C. Collins et al., 2019; National Academies of Sciences, Engineering, and Medicine, 2018), but reaching housing stability in the long-term has been identified as an unsolved problem (Bassuk, DeCandia, Tsertsvadze, & Richard, 2014), with further investigation urgently needed (Bassuk, DeCandia, Tsertsvadze, & Richard, 2014; C. Collins et al., 2019; National Academies of Sciences, Engineering, and Medicine, 2018). One large multi-site study involving three years of follow-up comprehensively studied the effects of random assignment to long-term rent subsidies, short-term rent subsidies, and transitional housing combined with support services all compared to TAU among families experiencing homelessness in the U.S. (Gubits et al., 2018). Findings strongly favoured the long-term rent subsidy intervention compared to TAU, with significantly reduced homelessness, increased housing stability, and a variety of improved outcomes among children, including, but not limited to, a significantly reduced percentage of families with ≥1 child separated in the past 6 months at 20 months of follow-up, fewer school absences at 20 months of follow-up, reduced behavioral problems at 37 months of follow-up, and increased food security at 20 and 37 months of follow-up.

The present study involved several limitations. First, with the exception of the Multnomah Community Ability Scale (Barker et al., 1994), all variables were self-reported and may have been influenced by social desirability and recall bias. However, previous analyses have demonstrated validity of self-report from participants of VAH (Somers et al., 2016). Second, there was insufficient statistical power to include transgender and transsexual as separate variable levels, as one participant self-identified as transgender and another as transsexual. Third, follow-up was limited to two years. Longer follow-up is needed to assess the stability of the differences we observed. Fourth, probability sampling was not employed in VAH, limiting generalizability. Lastly, the selection of 90% as the cut-off for housing stability is stringent and may be construed as a limitation, as the definition of stable housing used in the present study excluded periods of time spent in temporary accommodations outside of one's residence (e.g., hospitals, custody, days spent visiting friends, and other possible travel). Further research on the optimal cut-off may be useful.

2.6. Conclusions

To our knowledge, no studies have investigated the effect of experiencing homelessness in childhood or youth on later housing stability as an adult in HF, and hence, the present study is the first of its kind. We found that participants who had first experienced homelessness in their childhood or youth had about half the odds of experiencing housing stability within HF as defined by spending at least 90% of days in stable housing. This association was both significant and independent. Our findings have implications for service delivery in HF. They also emphasize the importance of intervening earlier in life in childhood and youth before experiencing homelessness and before it becomes chronic, potentially resulting in poorer health and social outcomes. Future research should investigate how best to support adults experiencing housing instability within HF, and how to intervene to best support the housing and related health and social needs of children and youth experiencing homelessness.

2.7. Research funding

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Chapter 3.

Multivariable Modelling of Factors Associated With Criminal Convictions Among People Experiencing Homelessness and Serious Mental Illness: A Multi-Year Study

3.1. Abstract

People experiencing homelessness and serious mental illness exhibit high rates of criminal justice system involvement. Researchers have debated the causes of such involvement among people experiencing serious mental illness, including what services to prioritize. Some, for example, have emphasized mental illness while others have emphasized poverty. We examined factors associated with criminal convictions among people experiencing homelessness and serious mental illness recruited to the Vancouver At Home study. Participants were recruited between October 2009 and June 2011. Comprehensive administrative data were examined over the five-year period preceding study baseline to identify risk and protective factors associated with criminal convictions among participants (n=425). Seven variables were independently associated with criminal convictions in the multivariable model, some of which included drug dependence (RR=1.53; p=0.009), psychiatric hospitalization (RR=1.44; p=0.030), an irregular frequency of social assistance payments (compared to regular payments; 1.75; p<0.001), and prior conviction (RR=3.56; p<0.001). Collectively, findings of the present study implicate poverty, social marginalization, crises involving mental illness, and the need for long-term recovery-oriented services that address these conditions to reduce criminal justice system involvement among people experiencing homelessness and serious mental illness.

Milad Parpouchi contributed to study conception and design, data collection, data analysis and interpretation, development of hypotheses, and wrote this chapter.

3.2. Introduction

Prior studies have consistently reported disproportionate criminal justice system involvement (CJSI) among people experiencing homelessness (e.g., Greenberg & Rosenheck, 2008a, 2008b; Martell et al., 1995; Snow et al., 1989; Tsai et al., 2014) or serious mental illness (e.g., Baillargeon et al., 2009; Baranyi et al., 2019; Fazel & Danesh, 2002; Fazel et al., 2016). People experiencing both homelessness and serious mental illness may have even higher rates of CJSI compared to people experiencing serious mental illness only (Roy et al., 2014). However, the relative contributions of homelessness and serious mental illness to risk of CJSI among people who experience both is less clear (Roy et al., 2014).

Homelessness itself may increase the risk of CJSI, as the behavior of people living on the streets is more visible (Desai et al., 2000). Laws may also prohibit behaviors inherent to homelessness, such as sleeping on the streets (Robinson, 2017). People experiencing serious mental illness also have a higher likelihood of experiencing homelessness both in the community (Folsom et al., 2005) and prior to and following release from incarceration (Baillargeon et al., 2010), and homelessness has been found to be significantly associated with CJSI among populations of people experiencing serious mental illness or people accessing mental health services (Constantine et al., 2010; Constantine et al., 2012; M. White et al., 2006). Moreover, people experiencing homelessness, including those with mental illness, are more likely to be arrested for or to commit crimes of a more minor or non-violent nature, which may be related to visibility as well as survival and subsistence (Constantine et al., 2010; P. Fischer, 1988; S. Fischer et al., 2008; Kouyoumdjian et al., 2019; Roy, Crocker, Nicholls, Latimer, & Isaak, 2016; Snow et al., 1989; Tsai et al., 2014). Greenberg and Rosenheck, for instance, found homelessness to be significantly associated with committing a property crime in data from U.S. prisons (Greenberg & Rosenheck, 2008a) and jails (Greenberg & Rosenheck, 2008b). They also found a lower prevalence of homelessness in prisons than jails, which was interpreted as consistent with the notion that people experiencing homelessness are more likely to commit minor crimes related to survival and subsistence (Greenberg & Rosenheck, 2008a, 2008b), since jails are intended for more minor crimes than prisons

(Bureau of Justice Statistics, n.d.; Greenberg & Rosenheck, 2008a). In a Canadian study of people experiencing homelessness and serious mental illness (PEHSMI) who had reported being arrested in the 6 months preceding study baseline, those who were arrested for minor offences specifically had the greatest likelihood of being re-arrested (Roy, Crocker, Nicholls, Latimer, & Isaak, 2016). Mental health symptoms have also been found to predict committing non-violent crimes among PEHSMI (S. Fischer et al., 2008). It is important to note, however, that homelessness has also been found to be associated with violent crime in the past (Greenberg & Rosenheck, 2008a, 2008b). PEHSMI have also been found to commit major crimes at rates higher than the general population (Desai et al., 2000). Furthermore, the immense stresses of homelessness may exacerbate mental health symptoms in people living with mental illness, leading to detection and detainment by police (Martell et al., 1995).

There is widespread agreement that disinvestments in and inadequate provision of supports and services are responsible for the overrepresentation of people experiencing serious mental illness in the criminal justice system. However, the role of mental illness itself and what specific services to prioritize to reduce CJSI have been the subject of debate (e.g., Draine et al., 2002a, 2002b; Nelson, 2002; Peterson et al., 2010; Prins, 2011). A hypothesis known as "the criminalization of mentally disordered behavior" (Abramson, 1972 p. 104) causally links deinstitutionalization from psychiatric hospitals with a consequent increase in CJSI of people experiencing serious mental illness. This has been referred to as "a shunting of mentally ill persons in need of treatment into the criminal justice system instead of the mental health system" (Lamb, 2001, p. 13). Although they recognize the importance of community-based treatment, Lamb and Weinberger (2005) use the aforementioned hypothesis to also specifically argue that a "shortage of psychiatric beds" (p. 533) is a key factor in explaining CJSI among people experiencing serious mental illness, and that this necessitates not only short and medium term psychiatric hospitalization but also longer-term hospitalization for many. Other researchers have found that mental health symptoms and subsistence-related crimes are not the primary reason for disproportionate CJSI among people experiencing serious mental illness and instead criminogenic traits (e.g., impulsivity) irrespective of serious mental illness are more primary drivers, the treatment of which may have greater effect

(Peterson et al., 2010). Still, other researchers have argued that increasing the number of psychiatric hospital beds would have little impact on CJSI and that for most people living with serious mental illness:

> …the key to staying out of hospitals, jails, and prisons may be a place to live, a job or some income support, a meaningful relationship or social network, quality healthcare, or linkage to treatment instead of frequent arrest for substance use disorders – fundamental needs that can best be redressed in the community, not psychiatric or correctional institutions. (Prins, 2011, p.720)

In describing adverse social outcomes among people living with serious mental illness, such as CJSI and homelessness, Draine et al. (2002b) argue "…that mental illness is not as potent an explanatory factor for these problems as the psychiatric literature might lead us to believe" (p. 565). Notwithstanding the role serious mental illness may play (Draine et al., 2002a), they argue that the social context is key in that the relationship between serious mental illness and adverse social outcomes, such as CJSI, are strongly moderated by poverty-related factors (e.g., low income, substance use, unemployment, etc.; Draine et al., 2002b). Nelson (2002) counter argued that "it is the clinical consequences of untreated mental illness that lead many-although not admittedly all- persons with mental illness to the criminal justice system, unemployment, and homelessness" (p.573).

Correctly identifying factors associated with CJSI is important for informing relevant public policies and services to reduce CJSI. Unresolved questions about the factors contributing to the disproportionate CJSI of people experiencing serious mental illness have fundamental implications for interventions, including what services and supports to prioritize.

Specifically among PEHSMI, factors that have been found to be associated with CJSI have not been investigated in multivariable models that also use objective sources of data over long periods of time. Based on a systematic review of CJSI among PEHSMI, most previous studies examining correlates have been conducted using self-report data, and those with longitudinal data have spanned periods of less than 2 years (Roy et al.,

2014). Moreover, the majority have been based in the U.S.. To the best of our knowledge, no subsequent studies have addressed all of these limitations.

Use of administrative data as a measure of service use is commonly regarded as a "gold standard" (Lemieux et al., 2017, p. 87) approach and overcomes limitations associated with bias including decayed accuracy of recall. Although agreement between self-reported and administrative CJSI data has been reported as "good" (Lemieux et al., 2017, p. 86) or "substantial" (Somers, Moniruzzaman, Currie, et al., 2016, Results section, para. 2) among PEHSMI, these are not the highest levels of agreement, and it has been found that under-reporting is a potential problem when specifically asking about the number of occurrences of CJSI as opposed to any occurrence (Lemieux et al., 2017) as well as when asking about jail (Somers, Moniruzzaman, Currie, et al., 2016). To our knowledge, no prior studies of CJSI among PEHSMI have conducted multivariable analyses that also draw on objective measures for periods of time exceeding two years. To address these limitations, we investigated the CJSI of PEHSMI based on up to 10 years of observation using a Canadian provincial inter-ministry database covering the entire Province of British Columbia (BC), with linked comprehensive justice, health, and social services-related data. Our primary objective was to identify risk and protective factors associated with criminal convictions over a five-year period using multivariable modelling.

3.3. Methods

3.3.1. Data sources, participant recruitment, and study procedures

The data source for the present analyses was the Vancouver At Home (VAH) study (Somers et al., 2013). VAH was mounted to investigate the effects of supported housing, specifically Housing First (HF), on a variety of outcomes among PEHSMI in Vancouver, BC, Canada. Although two randomized controlled trials were included in VAH (Current Controlled Trials: ISRCTN57595077 and ISRCTN66721740), the current study only analyzed pre-randomization data and included participants from both trials.

Both linked administrative records and self-reported baseline data from VAH were included. The Research Ethics Board of Simon Fraser University approved the study.

Community agencies and institutions providing services to PEHSMI (e.g., drop-in centres) located throughout Metro Vancouver referred potential participants to VAH from October 2009 to June 2011. Eligibility screening involved two steps: 1) briefly over the phone with the referring agency, and for those seemingly eligible 2) more comprehensive in-person screening. Referred individuals were enrolled in the study if they met eligibility criteria. These criteria included: 1) Canadian citizenship, 2) age 19 or older, 3) absolutely homeless or unstably housed, and 4) serious mental illness according to the Mini International Neuropsychiatric Interview (MINI) criteria (Sheehan et al., 1998). Potential participants were considered absolutely homeless if they had "no fixed place to sleep or live for more than 7 nights [in the past week] and little likelihood of obtaining accommodation in the coming month" (Somers et al., 2013, p. 3). They were considered unstably housed if they resided "in marginal accommodation, such as a SRO [single-room occupancy] hotel, and having two or more episodes of [absolute] homelessness (as defined above) during the past 12 months" (Somers et al., 2013, p. 3). After enrollment, an in-depth baseline interview was conducted, lasting about 90-180 minutes. Separate informed consent procedures addressed: 1) consent to participate in VAH and 2) consent to access participants' administrative records from three BC Government ministries (Ministries of Justice, Health, and Social Development and Social Innovation[2]). One randomized controlled trial was mounted for participants with a high level of need for support and another for those with a moderate need. A participant was considered as having a high level of need for support if they had a psychotic or bipolar disorder (per MINI), received a score of ≤62[3] on the Multnomah Community Ability Scale (Barker, Barron, McFarland, & Bigelow, 1994; Barker, Barron, McFarland, Bigelow, & Carnahan, 1994), and had one or more of: 1) a history of arrest or incarceration in the past six

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[2] Currently called the BC Ministry of Social Development and Poverty Reduction

[3] This cutoff was derived from a previous validation study of the Multnomah Community Ability Scale (Barker, Barron, McFarland, Bigelow, et al., 1994) and was reviewed by clinical investigators of the parent study of VAH, called At Home/Chez Soi, who confirmed the appropriateness of the cut-off in the process of protocol development.

months, 2) two or more psychiatric hospitalizations in one of the past five years, or 3) substance dependence (per MINI) in the past month. Participants who did not meet the high needs inclusion criteria were considered as having a moderate level of need for support. The present analyses included socio-demographic information collected during the baseline interviews, as well as which of the two randomized controlled trials that participants were assigned to (based on indications of "moderate" versus "high" needs for psychosocial support).

The Inter-Ministry Research Initiative (IMRI) was utilized to access comprehensive, linked administrative data from the BC Ministries of Justice (data availability: from 1997 to study randomization), Health (data availability: from 1990 to study randomization), and Social Development and Social Innovation (data availability: 1997 to study randomization; Somers, Moniruzzaman, Rezansoff, et al., 2016). All provincial conviction-related information was accessed using the Ministry of Justice data included in the IMRI. Anyone at least 18 years of age sentenced in a court in BC is entered into this database. All health service use-related information came from the Ministry of Health data contained in the IMRI. Billing data from the universal health insurance plan in BC, called Medical Services Plan (MSP), comprises a subset of the data from the Ministry of Health and was used to ascertain participant diagnostic information based on The International Classification of Diseases, Ninth Revision (ICD-9) codes. The diagnoses represented by these codes are determined by licensed health professionals in the community for billing purposes. Hospitalization data was included using the Discharge Abstracts Database from the Ministry of Health included in the IMRI. The International Classification of Diseases-10-CA, Canada (ICD-10-CA) was used to determine the disorder related to hospitalization. A list of relevant ICD-9 and ICD-10-CA codes and their descriptions used for the current analyses are presented in section 3.9 (Supplemental Information; Tables 3.5-3.8). Social assistance information in the IMRI came from the Ministry of Social Development and Social Innovation. Additional VAH details regarding participant recruitment, study procedures, and power calculations have been outlined in Somers et al. (2013). Further details about the IMRI have also been published (Somers, Moniruzzaman, Rezansoff, et al., 2016).

3.3.2. Variables of interest

Variables were included based on peer-reviewed literature and availability of data in VAH and the IMRI. The following self-reported socio-demographic variables collected during the VAH baseline interview were included as independent variables in the current analyses: age at randomization, gender, ethnicity, education, lifetime duration of homelessness, age of first experiencing homelessness, and level of need for support. Details concerning questionnaires used in VAH have been published (Somers et al., 2013).

Administrative data from the IMRI were used for the remaining independent variables included in the current analyses. Criminal convictions (related to federal and provincial offences) occurring in any court in BC were included. Convictions resulting in incarceration in provincial (<2 years) or federal prisons (≥2 years) were included. The date of the offence leading to conviction (as opposed to the date of conviction) was used in analyses. All offences reported were ones that led to conviction. Offence types were also reported (e.g., drug and alcohol-related, breach of court order, property, or violent). We included the following non-substance use-related mental disorders (NSMD), which were included as part of MSP data using ICD-9 diagnostic codes: schizophrenia (ICD-9 code: 295), bipolar disorder (ICD-9 code: 296), depressive disorder (ICD-9 code: 311) neurotic disorder (ICD-9 code: 300), and personality disorder (ICD-9 code: 301). Substance use disorders were identified in a similar manner and included: alcohol dependence (ICD-9 code: 303), drug dependence (ICD-9 code: 304), and nondependent drug abuse (ICD-9 code: 305). Hospitalization data included the following types: psychiatric (NSMD-related; ICD-10-CA codes: F00-F99 except F10-F19), substance use disorder-related (ICD-10-CA codes: F10-F19), and non-psychiatric (all codes except F00-F99). ICD-9 codes for mental disorders have been used in previous studies (Fazel et al., 2014; Rezansoff et al., 2017). Annual frequencies of social assistance payments were also included in the current analyses.

3.3.3. Statistical analysis

Participants who met criteria for each of the VAH randomized controlled trials were pooled in the current analyses to increase power. The study period consisted of the five-year period immediately preceding VAH baseline. Descriptive analyses were conducted and reported with means and standard deviations for continuous variables and frequencies and percentages for categorical variables. All variables measured using administrative records from the IMRI were reported using their values during the year preceding VAH baseline, while self-reported variables were reported using their values at VAH baseline. Descriptive convicted offence data were reported for the two-years preceding the study period (i.e., years 6 and 7 before baseline) and the ten-year period preceding VAH baseline.

The dependent variable was the number of convicted offences. This variable was measured as a count in each year of the five-year period preceding study baseline. A panel data structure was employed to measure the relationship between all independent variables and the dependent variable. Similar to the dependent variable, all time-varying independent variables were calculated in each year (annualized) of the study period (i.e., each of the 5 years preceding baseline). Data from all five years preceding baseline were included in the present analyses. Generalized estimating equations (GEE), a longitudinal analytic method, were conducted due to the use of repeated measures (Zeger & Liang, 1986). GEE specifications involved a negative binomial distribution with a log link function due to the count nature of the outcome data. An exchangeable correlation structure was further specified to address the dependency of within-subject observations over time. Robust standard errors were used to protect against potential mis-specification and heteroskedasticity (H. White, 1980). Dispersion parameters for the GEE models were imputed using the method suggested by Hilbe (Hilbe, 2011, 2014).

Both bivariate and multivariable GEE was conducted. All variables in the unadjusted model were forced into the adjusted model. A separate multivariable model was also created as a sensitivity analysis including only variables significant at $p \leq 0.05$ in the bivariate analysis. The following independent variables were treated as fixed: gender

(woman/man), ethnicity (Indigenous/White/Other), need level (moderate/high), education (less than high school/high school or more), lifetime duration of homelessness (≤3 yrs./>3 yrs.; dichotomized based on median), age of first homelessness (<25 years/ ≥ 25 years; dichotomized based on youth vs. adult), and prior offence (any conviction; during the two-year period preceding the study period). The following independent variables were treated as time-varying and measured on an annual basis during the five-year study period: age (years), time (years), schizophrenia (yes/no), bipolar disorder (yes/no), depressive disorder (yes/no), neurotic disorder (yes/no), personality disorder (yes/no), alcohol dependence (yes/no), drug dependence (yes/no), nondependent drug abuse (yes/no), psychiatric hospitalization (NSMD-related; yes/no), substance use disorder-related hospitalization (yes/no), non-psychiatric hospitalization (yes/no), and frequency of social assistance payments (none or single/irregular/regular). Rate ratios, including 95% confidence intervals, were presented as the measure of association. P-values were two-sided with significance set at alpha .05. Missing values for self-reported socio-demographic variables at VAH baseline were low (~1%) and were replaced with the median value for continuous variables and the largest category for categorical variables. Stata 16 (StataCorp, 2019) was used to conduct these analyses.

3.4. Results

A total of 497 participants met inclusion criteria and completed the baseline interview of VAH (200 were moderate needs and 297 were high needs). Of these participants, 425 (85.5%) provided consent to access their administrative data from all three BC ministries and were successfully linked. Prior comparisons between VAH participants who provided consent and those who did not have shown no significant differences (Rezansoff et al., 2016). Figure 3.1 displays the flow-through of participants.
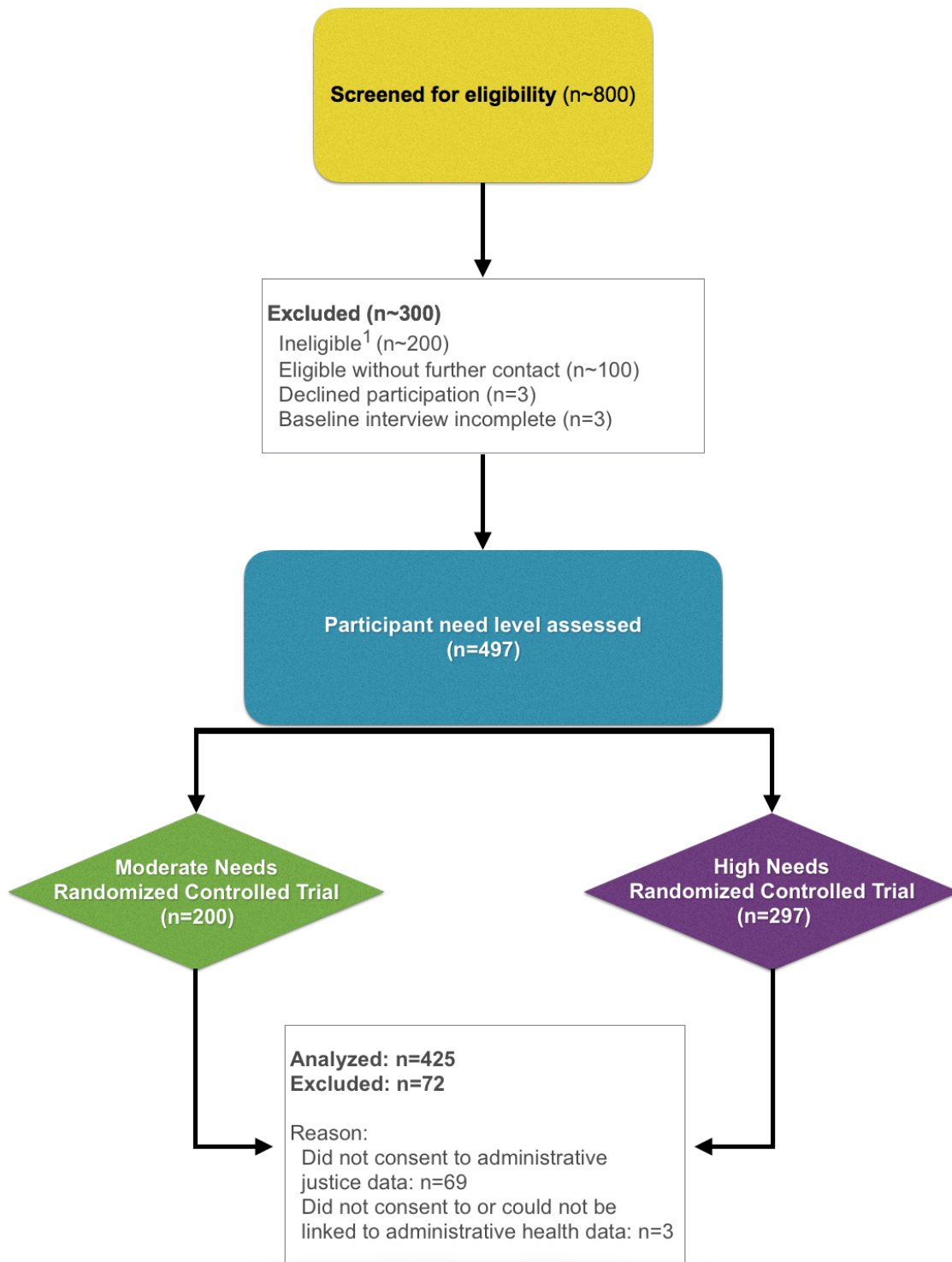
Figure 3.1.   Participant flow-through

1. About 100 participants were ineligible after telephone screening, and 94 participants after in-person screening.

Baseline socio-demographic characteristics of participants, as well as mental illnesses, substance use disorders, hospitalizations, and social assistance payment frequencies in the year preceding baseline are presented in Table 3.1.

Table 3.1. **Baseline characteristics of Vancouver At Home participants who consented to administrative data and could be linked (n=425)**

Variable[1]	Mean (SD) / n (%)
Socio-demographics	
Age at randomization	
Mean (SD)	40.8 (11.0)
Median (IQR)	41.4 (32.2, 47.8)
Age at beginning of study period	
Mean (SD)	35.8 (11.0)
Median (IQR)	36.4 (27.2, 42.8)
Gender, n (%)	
Woman	107 (25.4)
Man	314 (74.6)
Ethnicity, n (%)	
Indigenous	69 (16.2)
White	232 (54.6)
Other	124 (29.2)
Education level, n (%)	
High school or higher	178 (42.2)
Less than high school	244 (57.8)
Lifetime homelessness, (in months)	
Mean (SD)	58.6 (65.2)
Median (IQR)	36.0 (12.0, 84.0)
Lifetime homelessness, n (%)	
≤ 3 years	225 (53.6)
> 3 years	195 (46.4)
Age of first homelessness, n (%)	
< 25 years	187 (44.4)
≥ 25 years	234 (55.6)
Non-substance-related mental disorders (NSMD) during the year preceding baseline, n (%)	
Schizophrenia[2]	177 (41.7)
Bipolar disorder[3]	138 (32.5)
Neurotic disorder[4]	108 (25.4)
Personality disorder[5]	36 (8.5)
Depressive disorder[6]	124 (29.2)
Substance use disorders during the year preceding baseline, n (%)	
Alcohol dependence[7]	52 (12.2)
Drug dependence[8]	137 (32.2)

Variable[1]	Mean (SD) / n (%)
Nondependent drug abuse[9]	31 (7.3)
Acute hospitalization during the year preceding baseline, n (%)	
Psychiatric (NSMD-related) hospitalization	141 (33.2)
Substance use disorder-related hospitalization	48 (11.3)
Non-psychiatric hospitalization	67 (15.8)
Social assistance, n (%)	
Social assistance payments during the year preceding baseline None/single (0-1) Irregular (2-11) Regular (12)	 48 (9.4) 114 (26.8) 271 (63.8)

[1.] Socio-demographic variables were reported at study baseline and all other variables are reported using their values in the year before randomization.

[2.] The three digit ICD-9 diagnostic code, 295 from Medical Services Plan (MSP) claim data was used to determine schizophrenia.

[3.] The three digit ICD-9 diagnostic code, 296 from Medical Services Plan (MSP) claim data was used to determine bipolar disorder.

[4.] The three digit ICD-9 diagnostic code, 300 from Medical Services Plan (MSP) claim data was used to determine neurotic disorder.

[5.] The three digit ICD-9 diagnostic code, 301 from Medical Services Plan (MSP) claim data was used to determine personality disorder.

[6.] The three digit ICD-9 diagnostic code, 311 from Medical Services Plan (MSP) claim data was used to determine depressive disorder.

[7.] The three digit ICD-9 diagnostic code, 303 from Medical Services Plan (MSP) claim data was used to determine alcohol dependence.

[8.] The three digit ICD-9 diagnostic code, 304 from Medical Services Plan (MSP) claim data was used to determine drug dependence.

[9.] The three digit ICD-9 diagnostic code, 305 from Medical Services Plan (MSP) claim data was used to determine nondependent drug abuse.

Offence-related characteristics are presented in Table 3.2. The mean number of convicted offences over the five-year study period was 2.95, with an increasing trend every year up to baseline. When examining the ten-year period preceding baseline, the mean number of convicted offences was 5.4. The prevalence of any convicted offence during the five and ten years preceding baseline was 48.5% and 57.7%, respectively. Property offences (mean = 1.3) accounted for nearly half of all offences.

Table 3.2. **Convicted offence-related characteristics of Vancouver At Home participants who consented to administrative data and could be linked (n=425)**

Variable	Mean (SD) / n (%)
Offences during the study period, mean (SD)	
Year 1/5th last year preceding baseline	0.44 (1.57)
Year 2/4th last year preceding baseline	0.51 (1.46)
Year 3/3rd last year preceding baseline	0.60 (1.53)
Year 4/2nd last year preceding baseline	0.62 (1.46)
Year 5/last year preceding baseline	0.78 (1.72)
Year 1 to year 5 (entire study period)	2.95 (5.6)
Offences during the study period, n (%)	
None	219 (51.5)
≥1	206 (48.5)
Offences during the 10-year period preceding baseline, mean (SD)	5.4 (11.1)
Offences during the 10-year period preceding baseline, n (%)	
None	180 (42.3)
≥1	245 (57.7)
Type of offence during the study period, mean (SD)	
Drug & alcohol-related offence	0.2 (0.7)
Breach offence	0.7 (1.8)
Property offence	1.3 (3.6)
Violent offence	0.6 (1.3)
Prior offence (any conviction) during the 2-year period preceding study period, n (%)	
None	332 (78.1)
≥1	93 (21.9)

Unadjusted and adjusted rate ratios generated by the bivariate and multivariable GEE analyses are presented in Table 3.3. Although a number of variables were significantly associated with offending in the bivariate analysis, seven remained significant in the multivariable model, namely age (in years; RR = 0.98; 95% CI: 0.96-1.00), time (in years; RR = 1.17; 95% CI: 1.08-1.27), moderate need level (compared to high need level; RR = 0.59; 95% CI: 0.42-0.83), drug dependence (RR = 1.53; 95% CI: 1.11-2.11), psychiatric (NSMD-related) hospitalization (RR = 1.44; 95% CI: 1.04-1.99), irregular frequency of social assistance payments (compared to regular payments; RR = 1.75; 95% CI: 1.32-2.33), no social assistance payments (compared to regular payments; RR = 0.65; 95% CI: 0.43-0.97), and a prior offence (any conviction) during the 2-year period preceding the study period (RR = 3.56; 95% CI: 2.61-4.87).

Table 3.3. GEE negative binomial regression analysis to identify risk and protective factors associated with the number of convicted offences (measured annually) among Vancouver At Home participants during the five years preceding study baseline (n=425)

Variable	Unadjusted RR (95% CI)	P value	Adjusted RR (95% CI)	P value
Age (per year)	0.98 (0.97, 0.99)	**0.005**	0.98 (0.96, 1.00)	**0.024**
Time (per year)	1.14 (1.05, 1.24)	**0.001**	1.17 (1.08, 1.27)	**<0.001**
Man	1.66 (1.10, 2.50)	**0.015**	1.40 (0.95, 2.06)	0.087
Indigenous	2.07 (1.37, 3.13)	**0.001**	1.38 (0.90, 2.10)	0.139
White	0.84 (0.59, 1.21)	0.349	0.99 (0.67, 1.45)	0.954
Need level (moderate)	0.46 (0.32, 0.65)	**<0.001**	0.59 (0.42, 0.83)	**0.002**
Education (less than high school)	1.98 (1.38, 2.82)	**<0.001**	1.06 (0.76, 1.48)	0.736
Age of first homelessness (<25 years)	1.40 (0.98, 2.01)	0.065	0.90 (0.65, 1.27)	0.557
Lifetime homelessness (>3 years)	1.38 (0.96, 1.99)	0.087	1.23 (0.89, 1.72)	0.214
Schizophrenia (yearly, no vs. yes)	1.53 (1.10, 2.12)	**0.011**	1.00 (0.73, 1.36)	0.985
Bipolar disorder (yearly, no vs. yes)	1.21 (0.89, 1.64)	0.218	0.92 (0.69, 1.24)	0.596
Neurotic disorder (yearly, no vs. yes)	1.29 (1.00, 1.66)	0.053	1.07 (0.79, 1.45)	0.673
Depressive disorder (yearly, no vs. yes)	1.23 (0.95, 1.61)	0.121	0.92 (0.67, 1.27)	0.612
Personality disorder (yearly, no vs. yes)	1.50 (1.14, 1.96)	**0.003**	1.17 (0.82, 1.65)	0.385
Alcohol dependence (yearly, no vs. yes)	1.25 (0.80, 1.95)	0.332	1.00 (0.56, 1.77)	0.990
Drug dependence (yearly, no vs. yes)	1.95 (1.43, 2.65)	**<0.001**	1.53 (1.11, 2.11)	**0.009**
Nondependent drug abuse (yearly, no vs. yes)	1.77 (1.21, 2.60)	**<0.001**	1.20 (0.81, 1.77)	0.368
Psychiatric (NSMD-related) hospitalization (yearly, no vs. yes)	1.60 (1.22, 2.08)	**0.001**	1.44 (1.04, 1.99)	**0.030**
Substance use disorder-related hospitalization (yearly, no vs. yes)	1.55 (1.12, 2.16)	**<0.001**	1.25 (0.89, 1.75)	0.194
Non-psychiatric hospitalization (yearly, no vs. yes)	1.37 (1.04, 1.81)	**0.025**	1.10 (0.80, 1.51)	0.561
Social assistance payments (yearly)				
No (0-1)	0.40 (0.20, 0.58)	**<0.001**	0.65 (0.43, 0.97)	**0.035**
Irregular (2-11)	1.43 (1.09, 1.87)	**0.010**	1.75 (1.32, 2.33)	**<0.001**
Regular (> 11)	Reference			

Variable	Unadjusted RR (95% CI)	P value	Adjusted RR (95% CI)	P value
Prior offence (any conviction) during the 2-year period preceding study period (no vs. yes)	4.55 (3.30, 6.26)	**<0.001**	3.56 (2.61, 4.87)	**<0.001**

The sensitivity analysis results are presented in Table 3.4. Results were similar to the initial multivariable model, with the exception of psychiatric hospitalization, which became marginally significant in the adjusted model (RR = 1.36; 95% CI: 0.97-1.89).

Table 3.4. **Sensitivity analysis - GEE negative binomial regression analysis to identify risk and protective factors associated with the number of convicted offences (measured annually) among Vancouver At Home participants during the five years preceding study baseline (n=425)[1]**

Variable	Unadjusted RR (95% CI)	P value	Adjusted RR (95% CI)	P value
Age (per year)	0.98 (0.97, 0.99)	**0.005**	0.98 (0.97, 1.00)	**0.022**
Time (per year)	1.14 (1.05, 1.24)	**0.001**	1.17 (1.08, 1.27)	**<0.001**
Man	1.66 (1.10, 2.50)	**0.015**	1.43 (0.97, 2.10)	0.070
Indigenous	2.07 (1.37, 3.13)	**0.001**	1.40 (0.98, 1.98)	0.063
White	0.84 (0.59, 1.21)	0.349		
Need level (moderate)	0.46 (0.32, 0.65)	**<0.001**	0.58 (0.42, 0.81)	**0.001**
Education (less than high school)	1.98 (1.38, 2.82)	**<0.001**	1.09 (0.79, 1.50)	0.595
Age of first homelessness (<25 years)	1.40 (0.98, 2.01)	0.065		
Lifetime homelessness (>3 years)	1.38 (0.96, 1.99)	0.087		
Schizophrenia (yearly, no vs. yes)	1.53 (1.10, 2.12)	**0.011**	0.98 (0.72, 1.34)	0.912
Bipolar disorder (yearly, no vs. yes)	1.21 (0.89, 1.64)	0.218		
Neurotic disorder (yearly, no vs. yes)	1.29 (1.00, 1.66)	0.053		
Depressive disorder (yearly, no vs. yes)	1.23 (0.95, 1.61)	0.121		
Personality disorder (yearly, no vs. yes)	1.50 (1.14, 1.96)	**0.003**	1.17 (0.84, 1.62)	0.351
Alcohol dependence (yearly, no vs. yes)	1.25 (0.80, 1.95)	0.332		
Drug dependence (yearly, no vs. yes)	1.95 (1.43, 2.65)	**<0.001**	1.53 (1.13, 2.08)	**0.006**
Nondependent drug abuse (yearly, no vs. yes)	1.77 (1.21, 2.60)	**<0.001**	1.16 (0.79, 1.70)	0.435

Variable	Unadjusted RR (95% CI)	P value	Adjusted RR (95% CI)	P value
Psychiatric (NSMD-related) hospitalization (yearly, no vs. yes)	1.60 (1.22, 2.08)	**0.001**	1.36 (0.97, 1.89)	0.072
Substance use disorder-related hospitalization (yearly, no vs. yes)	1.55 (1.12, 2.16)	**<0.001**	1.24 (0.91, 1.70)	0.180
Non-psychiatric hospitalization (yearly, no vs. yes)	1.37 (1.04, 1.81)	**0.025**	1.12 (0.81, 1.54)	0.502
Social assistance payments (yearly) No (0-1) Irregular (2-11) Regular (> 11)	0.40 (0.20, 0.58) 1.43 (1.09, 1.87) Reference	**<0.001** **0.010**	0.65 (0.43, 0.97) 1.77 (1.33, 2.36) Reference	**0.036** **<0.001**
Prior offence (any conviction) during the 2-year period preceding study period (no vs. yes)	4.55 (3.30, 6.26)	**<0.001**	3.53 (2.60, 4.79)	**<0.001**

[1.] P≤0.05 was used to select variables from the unadjusted analysis for the multivariable model.

3.5. Discussion

Our results emphasize prior convictions, irregular receipt of social assistance payments, drug dependence, psychiatric hospitalization, time, and younger age as factors associated with a greater rate of CJSI among PEHSMI. Some of the variables that have been found to be significantly associated with CJSI in prior studies using unadjusted or adjusted analyses among PEHSMI, such as being a man (Desai et al., 2000; Roy, Crocker, Nicholls, Latimer, Gozdzik, et al., 2016; Roy, Crocker, Nicholls, Latimer, & Isaak, 2016), age of first homelessness (Roy, Crocker, Nicholls, Latimer, Gozdzik, et al., 2016), personality disorder (McGuire & Rosenheck, 2004), or ethnicity (Roy, Crocker, Nicholls, Latimer, & Isaak, 2016), were significant only in our unadjusted analyses (marginally significant in the case of age of first homelessness) and were no longer significant when included in our multivariable model. Furthermore, none of the serious mental disorders were significantly associated with convicted offences in our multivariable analysis, although psychiatric hospitalization was and may have accounted for the most symptomatic people experiencing serious mental illness. Taken collectively, the significant variables associated with convicted offences in our multivariable analysis suggest the need for publicly funded, long-term recovery-oriented support services that

simultaneously address poverty, social marginalization, and mental health and substance use treatment needs, as the potential focus of intervention. Since abstinence from substance use may not be a part of recovery for many (Martinelli et al., 2020), a range of recovery-oriented services should be available (i.e., nonabstinent and abstinent-contingent).

With regard to level of need for support, as mentioned above, incarceration and arrest in the six months preceding the baseline interview were criteria for inclusion in one of VAH's two need levels (i.e., high needs). It was therefore expected that a moderate level of need for support would be associated with a decreased rate of convictions compared to high needs.

Older age was also protective against criminal convictions, which is consistent with prior studies using a variety of CJSI variables among PEHSMI and more generally among people involved in the criminal justice system (Calsyn et al., 2005; Rezansoff et al., 2013; Roy, Crocker, Nicholls, Latimer, Gozdzik, et al., 2016). Time was strongly associated with offending, consistent with evidence that an accumulation of time homeless increases the risk for CJSI among PEHSMI (Calsyn et al., 2005; Desai et al., 2000; McGuire & Rosenheck, 2004; Roy, Crocker, Nicholls, Latimer, Gozdzik, et al., 2016). Maturation as a protective factor may be working in the opposite direction of exposure to homelessness, a structural risk factor. Increased recognition in the community, including by police, may have increased the likelihood of detention, arrest, and prosecution. It has also been argued that more time spent homeless may increase the frequency of committing crimes as an adaptive survival strategy (Snow et al., 1989). Lifetime duration of homelessness itself was not significantly related to offending, but a limitation of this variable was that it was measured cross-sectionally at study baseline and was dependent on recall.

Vancouver's Downtown Eastside, a neighbourhood where most participants of VAH were recruited from (Somers, Moniruzzaman, & Rezansoff, 2016) includes a tier of housing known as single-room occupancy hotels that are often of extremely poor quality and are associated with CJSI among their residents who use illicit drugs (Shannon et al.,

2006). Therefore, whether participants were housed in the Downtown Eastside may have made little difference and may also explain the lack of a significant association between lifetime duration of homelessness and CJSI in the present analyses. A prior analysis involving VAH participants also demonstrated that participants had increasingly migrated to the Downtown Eastside in the ten-year period preceding study baseline, accompanied by substantial increases in CJSI (Somers, Moniruzzaman, & Rezansoff, 2016).

Having a prior conviction before the study period was significantly associated with subsequent convictions during the study period, increasing the risk by over 3.5 times compared to those without a prior conviction. Prior CJSI as a factor that increases the risk of future CJSI is a well-established finding not only among PEHSMI but also in other populations (Bonta et al., 1998; Rezansoff et al., 2013; Roy et al., 2014).

Receiving an irregular frequency of social assistance payments increased the risk of criminal convictions by 75% compared to receiving payments regularly. A similar finding was reported by McGuire and Rosenheck (2004) but the relationship reported was unadjusted and involved lifetime incarceration (presence and duration) as the CJSI outcome. An irregular social assistance payment frequency was not only highly significant in the present study's multivariable model but also had one of the largest effect sizes. This finding suggests that social assistance payment regularity serves to protect PEHSMI from resorting to crime. The receipt of no social assistance payments (0-1 payment) was significantly associated with a lower rate of convictions compared to those receiving payments regularly. Participants not receiving social assistance payments may have been employed or had incomes exceeding social assistance eligibility requirements. Policies facilitating social assistance payment consistency and removing administrative barriers to enrollment may contribute to reductions in CJSI. Furthermore, it may be that strengthening income assistance programs to enable recipients to cover basic subsistence needs may have the added benefit of reducing CJSI. Supported employment is an evidence-based intervention among people experiencing serious mental illness (Campbell et al., 2011), provision of which to people interested in becoming employed may have the added benefit of contributing to reductions in CJSI.

The presence of drug dependence significantly increased the risk of convictions by 53%. Indeed, substance use-related variables have consistently been found to increase CJSI among PEHSMI (Calsyn et al., 2005; Desai et al., 2000; McGuire & Rosenheck, 2004; Roy, Crocker, Nicholls, Latimer, Gozdzik, et al., 2016). Drug dependence specifically, as opposed to nondependent drug abuse which was not significantly associated with criminal convictions, is the closest approximation to addiction in our multivariable model and had the largest effect size after irregular social assistance payments. The association between psychosocial marginalization and addictive use of drugs is well-established historically (Alexander, 2008; Robins et al., 1974). Participants of VAH had long histories of marginalization, including homelessness and unmet basic needs (e.g., food insecurity; Parpouchi et al., 2016). Individual-level substance use treatment programs are important in facilitating recovery from addiction (e.g., contingency management, motivational interviewing, opioid agonist treatment, etc.), but the scope of such recovery includes more than substance use itself (Martinelli et al., 2020). Services should also address and rectify structural factors that facilitate marginalization (e.g., homelessness) and hinder recovery from addictions. These services should be person- and family-centred as addiction recovery is individually defined (Davidson & White, 2007).

Lastly, hospitalization attributed to NSMD significantly and independently increased the risk of criminal conviction by 44%, while other types of hospitalization did not. Importantly, psychiatric hospitalization became marginally significant in the sensitivity analysis. This finding implicates the importance of symptom severity and may provide support for the criminalization of mentally disordered behaviour hypothesis (Abramson, 1972; Lamb 2001). It may also represent people who were in crisis and who were highly symptomatic in response to the conditions of homelessness. Moreover, the stress posed by homelessness while experiencing a serious mental illness may increase the likelihood of acute symptoms leading to hospitalization while also increasing the risk of being charged with a crime (Martell et al., 1995).

Breach offences were the second most common type of offence committed by participants in the present study, and, as Roy, Crocker, Nicholls, Latimer, Gozdzik et al.

(2016) argue, logistical challenges, competing demands on the time of people experiencing homelessness and mental illness, as well as lack of understanding of court ordered conditions, may preclude adherence to such conditions. It could also be that those in crisis and who were highly symptomatic may have been less likely to adhere to court orders. A criminal justice system that is more sensitive to such structural constraints may lead to a reduction in involvement of PEHSMI, but further research is needed to confirm this. Moreover, housing combined with health and social supports, including mental health treatment, may reduce crises leading to psychiatric hospitalization and CJSI. One study found that HF was associated with reduced days of psychiatric hospitalization (Gulcur et al., 2003). Using administrative data, Russolillo et al. (2014) reported significantly reduced emergency department use caused by the implementation of high-fidelity, choice-based HF. It is also possible, however, that some participants may need more structured and intensive services (Lamb & Weinberger, 2005).

It is important to note that the relationship between psychiatric hospitalization and CJSI may not necessarily implicate mental health symptoms as an explanation. For example, in a study of crime among PEHSMI, S. Ficher et al. (2008) found that recruitment of participants from psychiatric hospitals (versus the streets) was associated with a significantly higher risk of non-violent and violent crime. This finding remained significant despite having controlled for the effect of mental health symptom severity. The authors interpreted this finding as possibly suggesting that participants had initially been taken to hospital for committing an offence and continued offending post-discharge for reasons other than mental health symptoms.

Nearly six out of ten participants had at least one recorded offence in the ten years preceding study recruitment. This prevalence rate is within the range of lifetime rates of convictions found among PEHSMI that were reported in a previous systematic review (28.1-80%; Roy et al., 2014). Our prevalence is likely an underestimate because convictions that occurred among participants prior to age 18 during the 10 years before baseline would not be included in our estimate. Additionally, we found the vast majority of offences committed by participants were non-violent (79.7%) and instead mostly related to property, breaches of court orders, and crimes associated with drugs and

alcohol. These findings are consistent with observations made by other researchers describing people experiencing homelessness or PEHSMI as more likely to have CJSI due to minor or non-violent crimes directly related to poverty and homelessness itself (e.g., visibility, survival, and subsistence needs; Constantine et al., 2010; P. Fischer, 1988; S. Fischer et al., 2008; Kouyoumdjian et al., 2019; Roy, Crocker, Nicholls, Latimer, & Isaak, 2016; Snow et al., 1989; Tsai et al., 2014).

A few limitations inherent to the present study should be noted. First, a limited number of socio-demographic variables were self-reported, elevating the risk of recall and social desirability bias. Second, the service use of participants outside of BC would not have been captured in the IMRI. Third, participants had access to universal health insurance and this may hinder generalizability to locales with different health insurance schemes. Fourth, about 14.5% of participants randomized in VAH were excluded from analyses because they did not provide consent to access their administrative data from all three ministries or could not be linked, and any unmeasured differences between these participants and the ones included in analyses may affect results. Fifth, any coding errors in the IMRI may have influenced results. Sixth, due to lack of availability in the IMRI, additional covariates that have been found to be significantly associated with CJSI among PEHSMI could not be included in the present analyses, such as victimization (Roy, Crocker, Nicholls, Latimer, Gozdzik, et al., 2016; Roy, Crocker, Nicholls, Latimer, & Isaak, 2016), mental health symptoms (Calsyn et al., 2005; McGuire & Rosenheck, 2004), and childhood conduct disorder (Desai et al., 2000; McGuire & Rosenheck, 2004). Moreover, in some cases, we compared constructs that have been measured differently in previous studies (e.g., we used psychiatric hospitalization in place of mental health symptoms; S. Fischer et al., 2008). Furthermore, the psychiatric hospitalization variable did not include emergency department visits from the National Ambulatory Care Reporting System. Lastly, only "woman" and "man" were included as levels of the variable "gender" as few people self-identified as any other gender, limiting adequate statistical power to include additional genders in analyses.

3.6. Conclusions

The findings of the present study highlight several variables in explaining the disproportionate CJSI of PEHSMI. The importance of the present study's results is that they show that some variables reported in previous studies are only significant in bivariate modelling. When multivariable modelling is employed using a comprehensive set of linked administrative data spanning multiple years, the overall pattern of results implicates poverty, social marginalization, crises involving mental illness, substance dependence, and the need for long-term recovery-oriented services that address these conditions. At the present time, Pathways Housing First offers the most comprehensive and evidence-based response that addresses each of these domains (Tsemberis, 2015).

3.7. Research funding

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3.9. Supplemental information

Table 3.5.   ICD-9 diagnostic codes (290-319; mental disorders)[1]

ICD-9[2] Code	Description
290	Senile and presenile organic psychotic conditions
291*	*Alcoholic psychoses*
292*	*Drug psychoses*
293	Transient organic psychotic conditions
294	Other organic psychotic conditions (chronic)
295	Schizophrenic psychoses
296	Affective psychoses
297	Paranoid states
298	Other nonorganic psychoses
299	Psychoses with origin specific to childhood
300	Neurotic disorders
301	Personality disorders
302	Sexual deviations and disorders
303*	*Alcohol dependence syndrome*
304*	*Drug dependence*
305*	*Nondependent abuse of drugs*
306	Physiological malfunction arising from mental factors
307	Special symptoms or syndromes not elsewhere classified
308	Acute reaction to stress
309	Adjustment reaction
310	Specific nonpsychotic mental disorders following organic brain damage
311	Depressive disorder, not elsewhere classified
312	Disturbance of conduct not elsewhere classified
313	Disturbance of emotions specific to childhood and adolescence
314	Hyperkinetic syndrome of childhood
315	Specific delays in development
316	Psychic factors associated with diseases classified elsewhere
317	Mild mental retardation
318	Other specified mental retardation
319	Unspecified mental retardation
50B	Anxiety/depression

[1.] This table includes ICD-9 codes and descriptions of mental disorders listed in the document titled "Mental disorders" by the British Columbia Medical Services Plan, accessed on May 18, 2016. URL: http://www2.gov.bc.ca/assets/gov/health/practitioner-pro/medical-services-plan/diag-codes_mental.pdf
[2.] ICD-9: The International Classification of Diseases, Ninth Revision
*Indicates the diagnostic codes that were used to ascertain substance use disorders

Table 3.6. ICD-10-CA diagnostic codes (F00-F99) for mental and behavioural disorders[1]

ICD-10-CA[2] Code	Description
F00-F09	Organic, including symptomatic mental disorders
F10-F19	Mental & behavioural disorders due to psychoactive substance use
F20-F29	Schizophrenia, schizotypal & delusional disorders
F30-F39	Mood [affective] disorders
F40-F48	Neurotic, stress related & somatoform disorders
F50-F59	Behavioural syndromes associated with psychological disturbances & physical factors
F60-F69	Disorders of adult personality & behaviour
F70-F79	Mental retardation
F80-F89	Disorders of psychological development
F90-F98	Behavioural and emotional disorders with onset usually occurring in childhood and adolescence
F99	Unspecified mental disorder

[1] This table includes ICD-10-CA codes and descriptions of mental disorders listed in the document titled "International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Canada (ICD-10-CA), Volume 1 -Tabular List (ISBN 1-55392-804-0)" by the Canadian Institute for Health Information © 2009
[2] ICD-10-CA: The International Classification of Diseases, Tenth Revision, Canada

Table 3.7. ICD-9 diagnostic codes and descriptions of mental and substance use disorders included in analyses[1]

Mental/substance use disorder	ICD-9[2] code	Description
Schizophrenia	295	Schizophrenic psychoses
Bipolar disorder	296	Affective psychoses
Neurotic disorder	300	Neurotic disorders
Personality disorder	301	Personality disorders
Depressive disorder	311	Depressive disorder, not elsewhere specified
Alcohol dependence	303	Alcohol dependence syndrome
Drug dependence	304	Drug dependence
Nondependent drug abuse	305	Nondependent abuse of drugs

[1] This table includes ICD-9 codes and descriptions of mental disorders listed in the document titled "Mental disorders" by the British Columbia Medical Services Plan, accessed on May 18, 2016. URL: http://www2.gov.bc.ca/assets/gov/health/practitioner-pro/medical-services-plan/diag-codes_mental.pdf
[2] ICD-9: The International Classification of Diseases, Ninth Revision

Table 3.8. **ICD-10-CA diagnostic codes and descriptions of mental and behavioural disorders used for hospitalizations included in analyses[1]**

Type of hospitalization	ICD-10-CA[2] code	Description
Psychiatric (NSMD[3]-related)	F00-F99, except F10-F19	Shown in Table 3.6
Substance use disorder-related	F10-F19	Shown in Table 3.6
Nonpsychiatric	All codes except F00-F99	Shown in Table 3.6

[1.] This table includes ICD-10-CA codes and descriptions of mental disorders listed in the document titled "International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Canada (ICD-10-CA), Volume 1 -Tabular List (ISBN 1-55392-804-0)" by the Canadian Institute for Health Information © 2009

[2.] ICD-10-CA: The International Classification of Diseases, Tenth Revision, Canada

[3.] NSMD: non-substance use-related disorder

Chapter 4.

Factors Associated With Criminal Convictions Among Adults Experiencing Homelessness and Serious Mental Illness After Receiving Housing First

4.1. Abstract

Background: Housing First has been identified as a potential intervention to reduce criminal convictions among people experiencing both homelessness and serious mental illness. However, little is known about the factors that predict criminal justice system involvement after receiving Housing First.

Objective: To investigate factors associated with criminal convictions after Housing First is received by people experiencing homelessness and serious mental illness in Metro Vancouver, Canada.

Methods: People experiencing homelessness and serious mental illness were referred to the Vancouver At Home study by community service providers between October 2009 and June 2011. Vancouver At Home is a combination of two randomized controlled trials involving comparisons of Housing First to treatment as usual over a 24-month period. Participants from the Housing First arms of the study were included in analyses. The dependent variable, number of criminal convictions, was measured using provincial administrative data. A variety of baseline sociodemographic, mental disorder, and substance use-related variables were included. Negative binomial regression was utilized to examine the relationship between independent variables and criminal convictions.

Results: 255 participants met the study criteria and agreed to allow researchers to access their administrative records from the British Columbia Ministry of Justice. There were 273 convicted offences over a total follow-up of 678.4 person-years. Some of the factors significantly associated with criminal convictions in adjusted analyses included past-month daily drug use (RR = 2.36; CI: 1.26-4.42), past-month daily alcohol use (RR = 3.37; 95% CI: 1.32-8.59), being seen/talked to/visited by an addictions counselor in the

past month (RR = 0.22; 95% CI: 0.05-0.95), and the number of convictions in the past 2 years (RR = 1.36; 95% CI: 1.23-1.50).

Conclusions: Modifiable factors significantly associated with criminal convictions included substance use-related behaviours. Substance use treatment and improvements in the fidelity of Housing First may reduce drug and alcohol use and criminal convictions. They may also protect those engaging in daily drug and alcohol use from convictions. Identification of daily substance use among people experiencing homelessness and serious mental illness and enrolling in Housing First may aid support efforts to reduce criminal convictions.

Milad Parpouchi contributed to study conception and design, data collection, data analysis and interpretation, development of hypotheses, and wrote this chapter.

4.2. Introduction

Compared to the general population, the overrepresentation of people experiencing homelessness (Greenberg & Rosenheck, 2008a, 2008b), serious mental illness (Simpson et al., 2013), or both (Kouyoumdjian et al., 2019; Roy et al., 2014, 2016) in the criminal justice system is well-established. A review of criminal justice system involvement (CJSI) among people experiencing homelessness and serious mental illness (PEHSMI) reported high lifetime prevalence rates of arrest (62.9-90.0%), conviction (28.1%-80.0%), and incarceration (48.0%-67.0%; Roy et al., 2014). The review also found that the experience of both homelessness and serious mental illness seems to be associated with a higher rate of CJSI than experiencing serious mental illness alone.

Homelessness is significantly associated with CJSI (Constantine et al., 2010; Kouyoumdjian et al., 2019; McNiel et al., 2005) and has been found to increase the likelihood of minor or non-violent crimes among people experiencing serious mental illness (Constantine et al., 2010; Fischer et al., 2008; Kouyoumdjian et al., 2019). Greater public visibility and engagement in subsistence behaviors brought about by homelessness may lead to contact with police, other types of CJSI, or non-violent crime (Fischer et al.,

2008; Snow et al., 1989). Increased visibility may increase the chance of detection of behaviours that are illegal, such as drinking alcohol or substance use in public (Robinson, 2017; Snow et al., 1989). Some crimes may be directly associated with homelessness, such as trespassing in search of a place to sleep (Snow et al., 1989). Laws criminalizing homelessness, such as "quality of life laws" (Robinson, 2017, p. 42; e.g., against sleeping in public, loitering, panhandling, etc.), can also lead to CJSI.

In response to high rates of CJSI among PEHSMI, researchers have examined the impact of Housing First (HF) as a potential intervention (Leclair et al., 2019). HF is a psychosocial rehabilitation intervention (Tsemberis, 2013) providing both permanent housing and wrap-around health and social services originally provided to PEHSMI (Tsemberis, 1999; Tsemberis & Asmussen, 1999). Client choice is a fundamental element of the program and embedded at all levels (Tsemberis & Asmussen, 1999). For instance, clients choose their housing unit (from those available in the private market; Tsemberis, 1999; Tsemberis & Asmussen, 1999). Furthermore, participation in or adherence to treatment services available in the program (e.g., mental health treatment, vocational services, etc.) are not mandated, nor is substance/alcohol use abstinence (Tsemberis, 1999; Tsemberis & Asmussen, 1999). Even when engaging in HF services, clients direct treatment planning (Tsemberis & Asmussen, 1999).

Results from a randomized controlled trial involving administrative data found HF with assertive community treatment to reduce the risk of criminal convictions compared to treatment as usual (TAU; Somers, Rezansoff, et al., 2013). However, a recent systematic review, which did not include the aforementioned study, but included 5 others, did not find HF to be effective in affecting CJSI (Leclair et al., 2019). The discrepancy in findings may be explained by the methods of data collection used; to our knowledge, the investigation conducted by Somers, Rezansoff et al. (2013) is the only one to include both a randomized controlled trial and administrative data. The use of administrative records in ascertaining service use in particular has frequently been considered a "gold standard" (Lemieux et al., 2017, p. 87) approach. Prior studies have rated the agreement between administrative and self-reported data as "good" (Lemieux et al., 2017, p. 86) or "substantial" (Somers, Moniruzzaman, Currie, et al., 2016, Results

134

section, para. 2) among PEHSMI with the important caveats that underreporting may be an issue when asking about the number of CJSI events (Lemieux et al., 2017) or when measuring incarceration events (Somers, Moniruzzaman, Currie, et al., 2016). Hence, the jury is still out regarding the impact of HF on CJSI given the limited amount of relevant studies, methodological limitations, and equivocal findings.

What is more certain is that not all HF clients experience the same magnitude of reduced contact with the criminal justice system (Somers, Rezansoff, et al., 2013; Tsai et al., 2010). To our knowledge, no studies have reported factors associated with a CJSI outcome following enrolment in HF using multivariable modelling and with linked administrative data. Identifying such factors among HF clients is important to further understand indications for additional attention or supports. The present study addresses this need by investigating factors associated with convicted offences following enrollment in HF among PEHSMI.

4.3. Methods

4.3.1. Data sources, participant recruitment, and study procedures

The Vancouver At Home (VAH) study is a combination of two randomized controlled trials (Current Controlled Trials: ISRCTN57595077 and ISRCTN66721740) involving comparisons of HF to TAU among PEHSMI in Vancouver, Canada over a 24-month period. It is one site of a multi-site parent study, called At Home/Chez Soi, involving the investigation of HF in five Canadian cities (Goering et al., 2011). Data generated from VAH intervention arms, as well as linked administrative data, were analyzed in the present study. Ethics approval was provided by the Research Ethics Board of Simon Fraser University. All VAH protocol details have been reported in a prior publication (Somers, Patterson, et al., 2013).

Eligibility criteria for VAH included: Canadian citizenship, age 19 or older, serious mental disorder using the Mini International Neuropsychiatric Interview (Sheehan et al., 1998), and absolute homelessness or precarious housing. VAH defined absolute homelessness "as having no fixed place to sleep or live for more than 7 nights [in the past

week] and little likelihood of obtaining accommodation in the coming month" (Somers, Patterson, et al., 2013, p. 3). Precarious housing was defined as living "in marginal accommodation, such as a SRO [single-room occupancy] hotel, and having two or more episodes of [absolute] homelessness (as defined above) during the past 12 months" (Somers, Patterson, et al., 2013, p. 3). Community service providers from 40 agencies with clients who included PEHSMI (e.g., community mental health centres) aided participant recruitment by referring potential participants. The study recruitment period was from October 2009 to June 2011. Participant eligibility was assessed first by phone with service providers and then in person with the participant.

Baseline interviews followed study enrollment and involved a comprehensive array of self-reported questionnaires administered by trained interviewers, from ascertainment of mental illness to sociodemographic characteristics, community functioning, substance use, chronic health conditions, service use, and more. All instruments used in VAH have been listed in a previous publication (Somers, Patterson, et al., 2013).

In addition to asking for consent to participate in VAH, participants were also asked about consent for the research team to access their administrative records from three British Columbia (BC) ministries: the Ministries of Justice, Health, and Social Development and Social Innovation[4]. Data from these ministries are stored in the Inter-Ministry Research Initiative (IMRI) with further details published (see Rezansoff et al., 2013; Somers, Moniruzzaman, Rezansoff, et al., 2016). Only data from the BC Ministry of Justice were linked to participants and included in the present analyses. Data included criminal conviction-related information and were available from 1997.

VAH participants' support needs were categorized as either "moderate" or "high" based on an algorithm involving information collected at baseline (Somers, Patterson, et al., 2013). Specifically, the algorithm for high needs included the following: having a psychotic or bipolar disorder (Sheehan et al., 1998), scoring ≤62 on the Multnomah Community Ability Scale (MCAS; Barker et al., 1994), and having at least one of the

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[4] Currently called the BC Ministry of Social Development and Poverty Reduction

following: a history of arrest or incarceration in the past six months, two or more psychiatric hospitalizations in a 365-day period within the past five years, or having substance dependence in the preceding month (Sheehan et al., 1998). Those not meeting the aforementioned high needs criteria were included as moderate needs. Adaptive randomization was used to allocate participants to study arms. One of the randomized controlled trials of VAH included only high needs participants and its study arms included: scattered-site HF with ACT (HF-ACT), congregate HF with on-site support (CONG), and TAU involving the existing system of care and services. The second randomized controlled trial included only moderate needs participants, and its study arms included: scattered-site HF with intensive case management (HF-ICM) and TAU.

4.3.2. Interventions

HF-ACT involved market rental apartments located throughout Metro Vancouver. An individual suite was selected by each participant. Each of the residential buildings involved in HF-ACT did not have any more than 20% of suites allocated to VAH participants. Those randomized to this intervention also had access to 24/7 wrap-around health and social services provided by an ACT team.

All units in the CONG intervention were in a single building in Downtown, Vancouver and occupied by VAH participants. Each of these independent units included a bathroom and kitchenette, but other building amenities were shared, such as leisure, kitchen, and dining rooms. A multi-disciplinary team of health and social service practitioners provided treatment and services on-site accessible 24/7.

The HF-ICM intervention included identical housing as HF-ACT, but support services included intensive case management by a team of case managers. Case managers coordinated services required by participants from external sources.

All HF interventions provided by VAH had high overall fidelity (Macnaughton et al., 2015; Nelson et al., 2014). Fidelity is "the extent to which delivery of an intervention adheres to the protocol or program model originally developed" (Mowbray et al., 2003, p. 315). Housing was subsidized for affordability; participants spent ≤30% of their income

toward rent. Each VAH intervention has previously been described in greater depth (see Somers, Patterson, et al., 2013).

4.3.3. Follow-up methods

Interviewers of VAH conducted interviews with participants every 3 months (longer interviews were conducted every 6 months). Honoraria for these interviews ranged from $20-$40, and interviewers used multiple methods to keep in contact with participants and to retain them in the study (see Strehlau et al., 2017). These methods included seeking updates on areas the participants usually visited or stayed in and obtaining contact information of other people in the participant's social network. Interviews were conducted in places preferred by the participant. Participants were also invited to visit the VAH field office at their convenience to socialize.

4.3.4. Variables of interest

The number of convicted offences (provincial or federal) sentenced in any court in BC in the post-randomization period served as the dependent variable in the present analyses. Linked conviction data in the IMRI for each consenting VAH participant came directly from the BC Ministry of Justice. Conviction data were available for each participant while they were age 18 or older. These data also included the type of convicted offences.

Independent variables were selected using peer-reviewed literature and included self-reported variables at VAH baseline. Sociodemographic characteristics included: age at randomization (years), gender (woman/man), ethnicity (Indigenous, White, Other), education (less than high school/high school or higher), income (<$800/≥$800; dichotomized based on approximate median), lifetime duration of homelessness (1-3 years/>3 years; dichotomized based on median), and age of first homelessness (<25 years/≥25 years). The following behaviour and mental disorder-related variables were included: impulse control (total score; a higher score represents greater impulse control; individual item taken from MCAS; Barker et al., 1994), having one or more mental disorders from the less severe cluster (yes/no; includes major depressive episode, panic

disorder, or post-traumatic stress disorder; Sheehan et al., 1998), having one or more mental disorders from the severe cluster (yes/no; includes psychotic disorder, mood disorder with psychotic features, or manic or hypomanic episode; Sheehan et al., 1998), the Colorado Symptom Index (total score; a higher score represents greater symptom severity; Boothroyd & Chen, 2008), and being hospitalized for mental illness at least two times in a 365-day period during the past 5 years (yes/no). Substance use-related variables included: daily drug use in the past month (yes/no; excluding alcohol; Marsden et al., 1998), daily alcohol use in the past month (yes/no; Marsden et al., 1998), and having been seen, talked to, or visited by an addictions counselor in the past month (yes/no). The number of convicted offences in the two years before baseline was also included from the IMRI. Instruments used to elicit information for the aforementioned variables, as well as all other instruments used in VAH are listed by Somers, Patterson et al. (2013).

4.3.5. Statistical analysis

Data from the active intervention arms of VAH were pooled for the present analyses (i.e., HF-ACT, CONG, and HF-ICM), while both TAU groups were excluded. Original sample size and power calculations of the VAH randomized controlled trials have been published (Somers, Patterson, et al., 2013). Continuous variables were presented by descriptive statistics (i.e., means, standard deviations, medians, and inter-quartile ranges) and categorical variables by percentages. The dependent variable, number of convicted offences, was comprised of overdispersed count data, and therefore, we used negative binomial regression (NBR) to estimate the effect of baseline independent variables on the rate of convicted offences post-randomization to HF. A bivariate NBR analysis was first conducted using all baseline variables listed above. These same variables were used to conduct the multivariable NBR analysis as independent variables were selected per literature. A sensitivity analysis was also included selecting variables with significance in the unadjusted model for inclusion in the adjusted model. Results were presented by rate ratios (RR), as well as their 95% confidence intervals and two-sided p-values. P-values below 0.05 were considered significant. Missing values for self-reported baseline variables ranged from 0.4%-2.0%

and were left excluded due to low proportions. Follow-up started at different times for participants, as recruitment took place between October 2009 and June 2011.

4.4. Results

Of all participants recruited and randomized to VAH study arms (n=497), 297 (60.0%) were randomized to a HF intervention. Of these 297 participants, 255 (85.9%) provided consent for the research team to access their administrative records from the BC Ministry of Justice. Rezansoff et al. (2016) did not detect any statistically significant differences in the characteristics of those who did and did not provide administrative data consent in VAH. Of the 255 participants included in the present analyses, 75 (29.4%) were randomized to HF-ACT, 87 (34.1%) were randomized to HF-ICM, and 93 (36.5%) were randomized to CONG. Participant flow is presented in Figure 4.1.
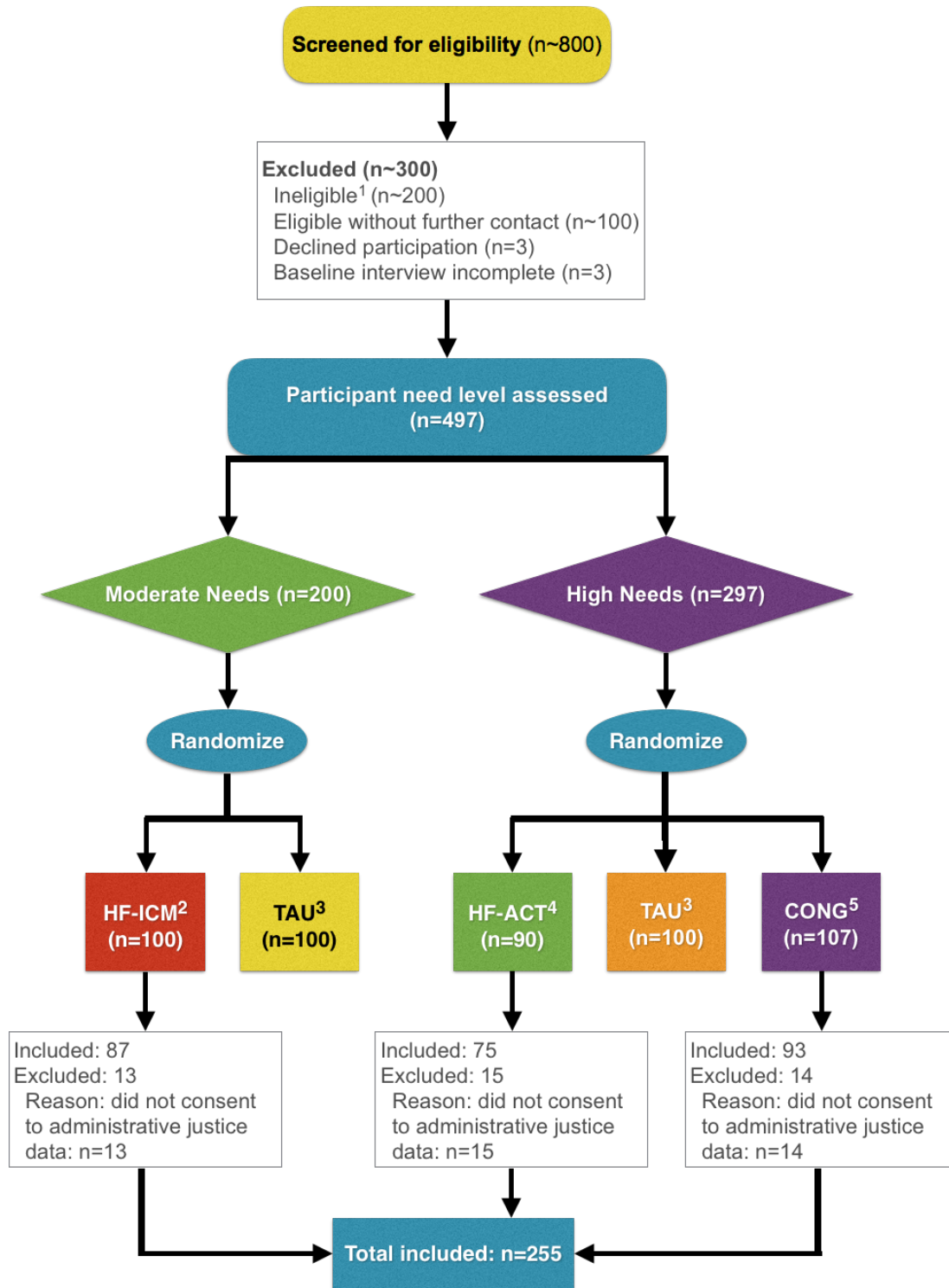
Figure 4.1.   Participant Flow

1. Includes about 100 participants ineligible after telephone screening, and 94 participants after in-person screening.
2. HF-ICM = Housing First with intensive case management
3. TAU = Treatment as usual
4. HF-ACT = Housing First with assertive community engagement
5. CONG = Congregate Housing First with on-site support

Table 4.1 outlines participant characteristics reported at baseline. Additionally, the mean number of convicted offences during the two-year period preceding baseline was 1.34 (SD = 2.46; data not shown).

Table 4.1. **Baseline characteristics of Vancouver At Home participants who provided administrative justice data consent and were randomized to a Housing First intervention (n=255)**

Variable	n (%) / mean (SD)
Socio-demographics	
Housing First intervention, n (%)	
HF-ACT	75 (29.4)
HF-ICM	87 (34.1)
CONG	93 (36.5)
Age at randomization	
Mean (SD)	40.7 (10.9)
Median (IQR)	41.6 (31.8, 48.2)
Gender, n (%)	
Woman	60 (23.6)
Man	194 (76.4)
Ethnicity, n (%)	
Indigenous	46 (18.0)
White	142 (55.7)
Other	67 (26.3)
Education, n (%)	
High school or higher	101 (40.1)
Less than high school	151 (59.9)
Income (past month) , n (%)	
≥$800	140 (55.8)
<$800	111 (44.2)
Lifetime homelessness, n (%)	
1-3 years	125 (49.8)
>3 years	126 (50.2)
Age of first homelessness, n (%)	
<25	110 (43.7)
≥25	142 (56.3)
Behaviour and Mental disorders	
Impulse control (total score)	
Mean (SD)	3.71 (1.04)
Median (IQR)	4 (3.0, 4.0)
Less severe cluster of mental disorders, n (%)	
No	123 (48.2)
Yes	132 (51.8)

Variable	n (%) / mean (SD)
Severe cluster of mental disorders, n (%)	
No	70 (27.4)
Yes	185 (72.6)
Colorado symptom index (total score)	
Mean (SD)	36.8 (12.9)
Median (IQR)	36.0 (26.4, 46.0)
Hospitalized for mental illness ≥2 times (in 365-day period within past 5 years), n (%)	
No	123 (48.2)
Yes	132 (51.8)
Substance use	
Daily drug use (excluding alcohol; past month), n (%)	
Daily	73 (28.7)
Less than daily/none	181 (71.3)
Daily alcohol use (past month), n (%)	
Daily	13 (5.1)
Less than daily/none	241 (94.9)
Seen/talked to/visited by an addictions counselor (past month), n (%)	
No	240 (94.1)
Yes	15 (5.9)
Number of offences (past 2 years)	
Mean (SD)	1.3 (2.5)
Median (IQR)	0.0 (0.0, 2.0)

Table 4.2 outlines post-randomization information pertaining to the number of convicted offences, person-years of follow-up, and the incidence rate of convicted offences all broken down by baseline socio-demographic, mental disorder, and substance use-related characteristics. There were a total of 273 convicted offences among participants following randomization to HF. Participants were followed for 678.4 person-years, and the incidence rate of convicted offences was 0.40 per person-year. Some of the types of offences committed post-randomization included: property offences (47.3% of all convictions), violent offences (22.0% of all convictions), breach offences (21.6% of all convictions), and drug and alcohol-related offences (1.8% of all convictions).

Table 4.2. Incidence rate of convicted offences post-randomization to Housing First by independent variables among Vancouver At Home participants who provided administrative justice data consent (n=255)[1,2]

Variable	Number of convicted offences	Follow-up (person-years)	Incidence rate of convicted offences (per person-year; 95% CI)
Socio-demographics			
Gender			
Woman	28	162.11	0.17 (0.11, 0.25)
Man	245	513.32	0.48 (0.42, 0.54)
Ethnicity			
Indigenous	66	121.32	0.54 (0.42, 0.69)
White	151	377.90	0.40 (0.34, 0.47)
Other	56	179.21	0.31 (0.24, 0.41)
Education			
High school or higher	82	266.43	0.31 (0.24, 0.38)
Less than high school	190	402.65	0.47 (0.41, 0.54)
Income (past month)			
≥$800	173	369.19	0.47 (0.40, 0.54)
<$800	77	298.25	0.26 (0.20, 0.32)
Lifetime homelessness			
1-3 years	122	327.94	0.37 (0.31, 0.44)
>3 years	150	339.79	0.44 (0.37, 0.52)
Age of first homelessness			
<25 years	153	293.61	0.52 (0.44, 0.61)
≥25 years	120	377.39	0.32 (0.26, 0.38)
Mental disorders			
Less severe cluster of mental disorders			
No	152	322.93	0.47 (0.40, 0.55)
Yes	121	355.50	0.34 (0.28, 0.41)
Severe cluster of mental disorders			
No	77	190.44	0.40 (0.32, 0.51)
Yes	196	487.99	0.40 (0.35, 0.46)
Hospitalized for mental illness ≥2 times (in 365-day period within past 5 years)			
No	122	342.14	0.36 (0.30, 0.43)
Yes	151	336.29	0.45 (0.38, 0.53)
Substance use			
Daily drug use (excluding alcohol; past month)			

Variable	Number of convicted offences	Follow-up (person-years)	Incidence rate of convicted offences (per person-year; 95% CI)
Daily	120	194.55	0.62 (0.51, 0.74)
Less than daily/none	153	480.52	0.32 (0.27, 0.37)
Daily alcohol use (past month)			
Daily	31	35.94	0.86 (0.15, 0.59)
Less than daily/none	242	639.13	0.38 (0.33, 0.43)
Seen/talked to/visited by an addictions counselor (past month)			
No	271	641.40	0.42 (0.37, 0.48)
Yes	2	37.02	0.05 (0.01, 0.20)

[1.] The incidence rate was derived by dividing the number of convicted offences by the number of person-years of follow-up.
[2] The total number of convicted offences in the post-period was 273 with a follow-up of 678.4 person-years, equating to an incidence rate of 0.40 offences per person-year of follow-up.

Results from the original multivariable analysis and sensitivity analysis are presented in Table 4.3 and Table 4.4, respectively. Past-month daily alcohol use was not included in the multivariable model of the sensitivity analysis since it was not significant in the unadjusted model. Other than that variable, however, the same independent variables significantly associated with the rate of convicted offences in the main multivariable model were also significant in the sensitivity analysis.

Table 4.3. **Unadjusted and adjusted negative binomial regression analyses to identify factors associated with convicted offences post-randomization to Housing First among Vancouver At Home participants who provided administrative justice data consent (n=255)**

Variable	Unadjusted RR (95% CI)	P value	Adjusted RR (95% CI)	P value
Age (years)	0.97 (0.94, 1.00)	**0.030**	0.98 (0.95, 1.01)	0.199
Gender (man)	2.63 (1.23, 5.60)	**0.012**	1.97 (1.00, 3.85)	**0.049**
Ethnicity				
Indigenous	Reference		Reference	
White	0.69 (0.32, 1.49)	0.342	1.55 (0.72, 3.35)	0.266
Other	0.53 (0.22, 1.30)	0.167	0.88 (0.38, 2.01)	0.756
Education (less than high school)	1.64 (0.87, 3.11)	0.126	0.86 (0.47, 1.57)	0.625
Income (≥$800; past month)	1.64 (0.89, 3.02)	0.111	1.31 (0.75, 2.30)	0.343
Lifetime homelessness (>3 years)	1.14 (0.60, 2.17)	0.687	0.86 (0.47, 1.57)	0.631
Age of first homelessness (<25)	1.61 (0.87, 2.98)	0.126	1.21 (0.66, 2.23)	0.542

Variable	Unadjusted RR (95% CI)	P value	Adjusted RR (95% CI)	P value
Impulse control (score)	0.78 (0.56, 1.10)	0.156	0.92 (0.73, 1.17)	0.509
Less severe cluster of mental disorders	0.71 (0.38, 1.31)	0.274	0.81 (0.44, 1.52)	0.518
Severe cluster of mental disorders	1.08 (0.54, 2.16)	0.832	1.33 (0.68, 2.60)	0.398
Colorado symptom index (score)	1.01 (0.99, 1.04)	0.227	1.00 (0.98, 1.02)	0.966
Hospitalized for mental illness ≥2 times (in 365-day period within past 5 years)	1.27 (0.69, 2.36)	0.444	0.81 (0.47, 1.40)	0.451
Daily drug use (excluding alcohol; past month)	1.92 (1.03, 3.59)	**0.041**	2.36 (1.26, 4.42)	**0.008**
Daily alcohol use (past month)	2.38 (0.98, 5.77)	0.056	3.37 (1.32, 8.59)	**0.011**
Seen/talked to/visited by an addictions counselor (past month)	0.13 (0.03, 0.53)	**0.004**	0.22 (0.05, 0.95)	**0.042**
Number of convictions (past 2 years)	1.41 (1.30, 1.54)	**<0.001**	1.36 (1.23, 1.50)	**<0.001**

Table 4.4. **Sensitivity analysis – unadjusted and adjusted negative binomial regression analyses to identify factors associated with convicted offences post-randomization to Housing First among Vancouver At Home participants who provided administrative justice data consent (n=255)[1]**

Variable	Unadjusted RR (95% CI)	P value	Adjusted RR (95% CI)	P value
Age (years)	0.97 (0.94, 1.00)	**0.030**	0.99 (0.96, 1.01)	0.345
Gender (man)	2.63 (1.23, 5.60)	**0.012**	2.10 (1.06, 4.14)	**0.033**
Ethnicity Indigenous	Reference			
White	0.69 (0.32, 1.49)	0.342		
Other	0.53 (0.22, 1.30)	0.167		
Education (less than high school)	1.64 (0.87, 3.11)	0.126		
Income (≥$800; past month)	1.64 (0.89, 3.02)	0.111		
Lifetime homelessness (>3 years)	1.14 (0.60, 2.17)	0.687		
Age of first homelessness (<25)	1.61 (0.87, 2.98)	0.126		
Impulse control (score)	0.78 (0.56, 1.10)	0.156		
Less severe cluster of mental disorders	0.71 (0.38, 1.31)	0.274		
Severe cluster of mental disorders	1.08 (0.54, 2.16)	0.832		
Colorado symptom index (score)	1.01 (0.99, 1.04)	0.227		
Hospitalized for mental illness ≥2 times (in 365-day period within past 5 years)	1.27 (0.69, 2.36)	0.444		

Variable	Unadjusted RR (95% CI)	P value	Adjusted RR (95% CI)	P value
Daily drug use (excluding alcohol; past month)	1.92 (1.03, 3.59)	**0.041**	2.06 (1.17, 3.62)	**0.012**
Daily alcohol use (past month)	2.38 (0.98, 5.77)	0.056		
Seen/talked to/visited by an addictions counselor (past month)	0.13 (0.03, 0.53)	**0.004**	0.22 (0.06, 0.78)	**0.018**
Number of convictions (past 2 years)	1.41 (1.30, 1.54)	**<0.001**	1.38 (1.28, 1.49)	**<0.001**

[1.] Variables significant in the unadjusted model (p≤0.05) were selected for inclusion in the adjusted model.

4.5. Discussion

Multivariable results of the present study identified five variables that were significantly and independently associated with the rate of convicted offences, three of which were modifiable and related to substance use. Participants who reported daily drug use (excluding alcohol) in the month before baseline had 2.36 times the rate of convicted offences in the post-randomization period compared to those who used less frequently or not at all. Similarly, daily alcohol use in the month before baseline increased the rate of convicted offences by 3.37 times in the post-randomization period. Substance use as a correlate of CJSI is a well-established finding among PEHSMI (Roy et al., 2014) and people experiencing serious mental illness only (Constantine et al., 2010; Swartz & Lurigio, 2007). Drug and alcohol use frequency and severity have also previously been found to be associated with CJSI among PEHSMI (Desai et al., 2000; McGuire & Rosenheck, 2004; Roy et al., 2016). Moreover, drug and alcohol use-related variables have also been found to be associated with CJSI recidivism (Bonta et al., 1998; Rezansoff et al., 2013) and violence (Mulvey et al., 2006) in populations of people experiencing mental illness.

Our findings conflict with those of previous research with three exceptions (i.e., substance use-related results, prior offence history, and gender). Intrapersonal and structural variables found to be significantly associated with CJSI among PEHSMI in past studies were either not significantly associated with criminal convictions in both unadjusted and adjusted models, or failed to retain significance when entered into the multivariable model. For example, prior studies have found that intrapersonal variables,

such as younger age (Calsyn et al., 2005; Roy et al., 2014, 2016), impulse control (Roy et al., 2016), mental health symptoms (Fischer et al., 2008; McGuire & Rosenheck, 2004), and structural variables, such as age of first homelessness (Roy et al., 2016) are significantly associated with CJSI or crime among PEHSMI. In light of these studies, the present findings suggest that either: 1) the housing and support services provided by HF were sufficient to disrupt the effects of the intrapersonal and structural variables included on the risk of criminal convictions or 2) these variables are not associated with criminal convictions among PEHSMI regardless of HF status. It is possible that in some cases, the former explanation applies and in other cases the latter. Further longitudinal research is needed to elucidate these relationships. Of those who were convicted of offences, the most common type was related to property (47.3%). Many of these property offences may have been committed in order to generate funds to fulfill subsistence needs or to purchase substances. A relatively small proportion of offences were directly related to drugs and alcohol (1.8%), and this may have been because participants were able to use substances in their housing making detection by police less likely than if they used in public. Moreover, there has been de facto decriminalization of illicit substance use over the past 10 years as the Vancouver Police Department has generally not charged people for personal possession (Saltman, 2020).

A prior VAH investigation of HF did not detect any statistically significant changes in daily substance use compared to TAU (Somers et al., 2015). Given this finding, combined with the well-established finding that substance use is significantly associated with CJSI, it may be unsurprising that daily substance use (drugs or alcohol) in the month before baseline was significantly associated with criminal convictions post-randomization to HF in the present study, as participants likely continued their pattern of drug and alcohol use.

One may argue that the positive relationship between daily drug or alcohol use and criminal convictions may be a result of insufficient support provided by HF (e.g., substance use treatment). After all, some of the other variables included in the multivariable model that have been shown to be associated with CJSI in other studies, did not exhibit significance among participants once in HF. However, as opposed to viewing

148

such an association as being a product of inherent HF program design deficits concerning substance use, it may be that fidelity itself was the problem. All sites of At Home/Chez Soi, the parent study to VAH, underwent formal HF fidelity assessments in the first (Nelson et al., 2014) and third (Macnaughton et al., 2015) years of the study. Overall fidelity was reported as high in both assessments (Macnaughton et al., 2015; Nelson et al., 2014). More specifically, using a four-point scale, the HF interventions of At Home/Chez Soi received a mean score of 3.47/4 and 3.62/4 after one and three years, respectively (Macnaughton et al., 2015). However, upon a closer look at the fidelity assessment results reported by Nelson et al. (2014), a few areas with considerable room for improvement stand out. The "service array" domain received the lowest score (2.84/4) after the first year, and the items in that domain receiving the lowest scores were "employment and educational services" (2.46/4) and "substance abuse treatment" (2.76/4). Services related to "social integration" also received a relatively lower score (2.96/4). Notably, other items in the "service philosophy" domain also received relatively lower scores, including "motivational interviewing" (2.90/4) and "person-centred planning" (2.74/4). Lower fidelity in the aforementioned domains may have contributed not only to the null effect of HF on daily substance use previously reported, but also to the inability of the HF interventions of VAH to mitigate the adverse consequences of daily drug and alcohol use, as measured by the rate of convicted offences. It is important to note that Macnaughton et al. (2015) reported improvements in the "service array" domain fidelity score on the second assessment increasing to 3.39/4, including improvements in "substance abuse treatment" (3.20/4) and "employment and educational services" (3.26/4). "Person-centred planning" (2.96/4) and "motivational interviewing" (3.10/4) also improved. These improvements, however, took place after three years and did not reach the threshold of high fidelity (i.e., ≥3.5/4). Further improvements in these areas of fidelity may reduce the effect of substance use on criminal convictions among HF clients. Indeed, having been visited, talked to, or seen by an addictions counselor in the month before baseline was associated with a significantly lower rate of convicted offences in the post-randomization period. It is unclear, however, whether these counseling services reduced the rate of criminal convictions because of reductions in substance use frequency, less harmful ways of using (e.g., using a reduced amount of

149

drug or alcohol leading to less impairment), or through other pathways. Further longitudinal research measuring the effect pathway of substance use counselling on criminal convictions may elucidate this relationship. In any case, HF programs may contribute to reductions in criminal convictions among PEHSMI engaging in daily drug and alcohol use by increasing the availability of substance use services and by engaging and motivating clients to participate in such services. Some substance use treatment programs that may help in this regard include motivational interviewing (Frost et al., 2018; Lawrence et al., 2017) and contingency management (Davis et al., 2016; Petry et al., 2017).

From a risk and screening standpoint, upon enrollment in HF, the five variables that remained significant in the multivariable model, particularly the modifiable substance use-related variables may be used to identify clients with increased risk of subsequent criminal convictions. This information may be useful in prioritizing participants in order to identify opportunities to provide additional supports and services throughout their tenure in the program.

A few limitations of the present study should be considered. Social desirability and recall bias may have affected the accuracy of self-reported variables measured at study baseline. For example, illicit behaviours such as drug use may have been underreported. Moreover, both the daily alcohol use variable as well as the variable measuring the receipt of services from an addictions counselor had wide confidence intervals affecting the certainty of these estimates. Larger sample sizes would make these estimates more robust. As a result of inadequate statistical power, genders other than "woman" and "man" were not analyzed separately. Lastly, participants with criminal convictions sentenced in courts outside of BC were not captured by the administrative database utilized in the present study.

4.6. Conclusions

The current analyses are the first to use administrative CJSI data and multivariable modelling to examine the prospective relationship between baseline

characteristics and criminal convictions among PEHSMI after receiving HF. Being a

man, engaging in daily drug or alcohol use in the month before baseline, as well as the

number of convicted offences in the two years preceding baseline were each significantly

associated with a greater rate of convicted offences. Having been seen, talked to, or

visited by an addictions counselor in the month before baseline was associated with a

significantly lower rate of convicted offences. These characteristics may be useful from a

screening standpoint, to identify HF clients with higher offending risk upon enrollment in

HF in order to offer relevant services going forward as needed. In the case of daily

substance use-related offending risks, improving the quality and availability of services

that directly or indirectly address daily substance use (e.g., motivational interviewing,

person-centred planning, and contingency management) may weaken this relationship

and contribute to reductions in convicted offences. It may also contribute to reductions in

convictions by reducing the frequency of substance use more generally.

4.7. Research funding

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Chapter 5.

Discussion and Conclusions

5.1. Summary of results

The results of the three original investigations of this thesis suggest factors significantly and independently associated with housing stability and criminal justice system involvement (CJSI) among people experiencing homelessness and serious mental illness (PEHSMI). A key methodological strength of the investigations described in Chapters 2 and 4 is the inclusion of Housing First (HF) participants that received the intervention via randomization. Additionally, the use of de-identified administrative data across multiple domains including for the outcome of criminal convictions is a key strength of the analyses outlined in Chapters 3 and 4. This was made possible through the creation of the Inter-Ministry Research Initiative (IMRI) following a risk-benefit analysis involving the application of the Canadian Psychological Association's Code of Ethics (Canadian Psychological Association, 2017). Collectively, the risk and protective factors suggested by analyses described in Chapters 2-4 may inform efforts to increase housing stability and reduce CJSI among clients of HF and to reduce CJSI among PEHSMI in the community.

The results reported in Chapter 2 strongly suggest that the experience of homelessness in childhood or youth decreases the likelihood of experiencing housing stability after entering HF as an adult. This finding confirmed the study hypothesis and may be important for efforts to end chronic homelessness through HF. Although there is a need for research to identify modifications and specific supports sufficient to increase housing stability among those who have experienced homelessness in their childhood or youth, existing research points to the experience of isolation as a potentially important factor both among youth (Forchuk et al., 2013) and adults experiencing homelessness who first experienced homelessness in youth (Johnson & Chamberlain, 2008). Development of independent living skills may also be important (Crystal, 1986; Forchuk et al., 2013; Helfrich et al., 2006). Existing HF programs around the world and those

being newly implemented may consider asking clients whether they experienced homelessness before the age of 25 for indications that additional supports may be required related to maintenance of stable housing. The results presented in Chapter 2 also add to a very limited research base reporting long-term consequences of childhood and youth homelessness (e.g., Cobb-Clark & Zhu, 2017; Cronley et al., 2015; Stablein & Appleton, 2013). They reinforce the importance of interventions to reduce homelessness among accompanied or unaccompanied children and youth, as such an experience can have adverse long-term consequences. Research has only begun to examine HF interventions and adaptations needed among youth (Forchuk et al., 2013; Gaetz, 2014, 2017; Kozloff et al., 2016), children, and families experiencing homelessness (Bassuk et al., 2014; Collins et al., 2019; National Academies of Sciences, Engineering, and Medicine, 2018).

Multivariable analyses of administrative panel data over a five-year period immediately preceding Vancouver At Home (VAH) baseline in Chapter 3 revealed factors associated with criminal convictions among PEHSMI. These results provide additional insight that is relevant to understanding the causes of CJSI among PEHSMI. Variables indicative of social marginalization and poverty were significantly and independently associated with increased risk of criminal convictions among participants, including irregular social assistance payments, drug dependence, prior convictions, and time. Psychiatric hospitalization was also a significant risk factor, but its relationship with criminal convictions is unclear (e.g., via mental health symptoms or a different reason). Importantly, specific mental disorders were not associated with differential risk for criminal convictions in the multivariable analysis, reinforcing the notion that mental disorders (e.g., schizophrenia) may not be independent causes of CJSI. CJSI is currently one of the main sources of public service costs associated with PEHSMI (Latimer et al., 2017). These funds may be better spent on publicly funded services that address the factors associated with criminal convictions reported in Chapter 3 in order to reduce CJSI, relieve pressure on the criminal justice system, and reduce related costs.

The analyses described in Chapter 4 emphasized substance use-related variables as baseline factors associated with criminal convictions among PEHSMI after being

randomized to HF. Daily alcohol and drug use were each significantly and independently associated with a greater rate of criminal convictions. On the other hand, receipt of addictions counselling in the month before study randomization was associated with a significantly reduced rate of criminal convictions in the multivariable model. Strengthening or adding to HF services and supports that affect substance use may facilitate reductions in criminal convictions. Being aware of HF clients engaging in daily drug or alcohol use may also help identify those who may require additional support as it relates to offending.

5.2. Implications for Housing First programs and public policies

Findings across Chapters 2-4 all point to marginalization and a related lack of belonging as a unifying theme. Marginalization has been defined as "occur[ing] when people are systematically excluded from meaningful participation in economic, social, political, cultural and other forms of human activity in their communities and thus are denied the opportunity to fulfill themselves as human beings" (Rao, 2007, p. 223). In Chapter 2, one of the potential needs that may need to be addressed among those who have experienced childhood or youth homelessness and continue to experience housing instability as an adult in HF is independent living skills and a sense of belonging and meaning. Previous studies have outlined independent living skill needs of youth experiencing homelessness (Crystal, 1986; Forchuk et al., 2013; Helfrich et al., 2006). Prior research has also underscored the need for a "meaningful role" (Johnson & Chamberlain, 2008, p. 578) and housed social connections to facilitate a sense of belonging and ultimately preclude a return to homelessness among people who have experienced homelessness in their childhood or youth and as an adult (Johnson & Chamberlain, 2008). In Chapter 3, findings largely emphasize the important role marginalization plays in increasing the risk of criminal convictions among PEHSMI. This was the case whether in the form of irregular social assistance receipt, prior criminal convictions, addiction as a well-established adaptive response to marginalization and the related lack of a sense of belonging (Alexander, 2008), crises resulting in psychiatric hospitalization which may very well be in response to the stresses of homelessness and mental health treatment needs (Martell et al., 1995), and time passing, likely in the

159

context of socio-economic deprivation. Chapter 4 findings suggest that the housing and support provided by HF are enough to disrupt the effect of several variables that were found to be significant in chapter 2 (e.g., income, psychiatric hospitalization, and age) and in previous literature on correlates of CJSI among PEHSMI (e.g., Roy et al., 2014). However, daily drug and alcohol use at baseline were each associated with an increased rate of criminal convictions in HF during follow-up.

The psychosocial rehabilitation model (PRM) that HF is based on is ultimately about helping bring back individuals from the margins of society by facilitating integration at all levels in the community where the individual can function as independently as possible and has a satisfying and meaningful place (Anthony, 1977; Solomon et al., 2011; Warner, 2012). As Warner (2012) eloquently states:

> Psychiatric rehabilitation provides a road to recovery. The goal of rehabilitation is to help people with a disability enjoy the best and fullest life possible. It offers a route to working, making friends, having fun and taking on responsibilities – in short, full citizenship. (p. 225)

There exist several specific evidence-based psychosocial rehabilitation interventions that may aid in facilitating the aforementioned goals, some of which include supported employment, social skills training, psychoeducation (Solomon et al., 2011; Warner, 2012), ACT, illness management and recovery, and integrated treatment for co-occurring disorders (Solomon et al., 2011). The inclusion of the above interventions not already included in HF programs may also aid housing stability among HF clients who have experienced homelessness in childhood or youth and help prevent CJSI after receiving the program.

In the case of people experiencing serious mental illness (PESMI) enrolled in HF who first experienced homelessness in childhood or youth, including supported employment and social skills training may address the lack of independent living skills and sense of belonging and meaning that has been reported among people who experienced homelessness in childhood or youth and whose homelessness persisted into adulthood. For example, the following are some quotes from qualitative interviews with adults experiencing homelessness who had become homeless as youth (<18) and

described the process of making new friends when newly homeless (Johnson & Chamberlain, 2008):

"I get along better with other homeless people. I don't know why. I'm more comfortable with people who have had a tough time" (p. 571).

"They started treating me like a mate … so I started hanging out with them" (p. 570).

"…you could mix with some people so you didn't feel as though you were completely on your own" (p. 570).

The following is a statement made by a participant randomized to HF in the At Home / Chez Soi study:

"I can't find a way to keep myself busy. I sleep till noon and then I get up and wonder what to do with myself … I get up, have a cigarette, go back to bed, have a cigarette, go back to bed … that's no way to live. It's not sufficient" (Macnaughton et al., 2016, p. 150).

One approach recommended by the founder of HF regarding loneliness is for staff to meet clients more frequently, and to introduce clients to peer supports, which may include staff members (Tsemberis, 2015). These peer staff members may also assist clients in participating in community events and meeting new people.

It is important to note that Patterson et al. (2013, 2015) found that many VAH participants had developed new hope, meaning, and community integration following stable housing, demonstrated by the following quotes:

"Normally, when I walk down the street, everyone is staring at me because I'm a junkie. But, a lot of the time lately… I'm feeling good and there's a lot of smiles" (Patterson et al., 2015, p. 4).

"Life's gone from chaotic to meaningful. I don't know. I really want to be present…" (Patterson et al., 2015, p. 4).

"I'm getting more solid in my thinking and in terms of what I want. Like a better relationship with my kids. … I have everything I need right now and the choices are my own…" (Patterson et al., 2013, p. 5).

Participants in the parent At Home/Chez Soi study also had similar experiences, captured by the following quotes:

"Because I have a dog, I met some people. I met one of my next door neighbours that has a dog too… . Actually, having the dog, I met a lot of people from my building" (Macnaughton et al., 2016, p. 147).

"I wouldn't have cared before because I wasn't a member of the community. I was what the community despised basically. The guy who hated the binners [individuals who collect bottles from recycling bins] is now standing beside me to help save a tree" (Macnaughton et al., 2016, p. 148).

For PEHSMI, the findings from Chapter 3 suggest that specific mental disorder diagnoses do not increase the risk of CJSI. The significant risk factors suggest that what is needed is a set of programs and public policies that address specific marginalizing factors as part of a comprehensive strategy. These include consistency in social assistance payments which would also aid in meeting one's basic needs. Supported employment (Campbell et al., 2011) may also be an important way of both increasing income and serving as a meaningful way to spend one's time. Evidence-based substance use treatment, such as contingency management (Davis et al., 2016; Petry et al., 2017), motivational interviewing (Frost et al., 2018; Lawrence et al., 2017), and, where appropriate, opioid agonist treatment (Russolillo et al., 2018), may contribute to addressing drug dependence, which was a risk factor for criminal convictions. Health and social services that reduce psychiatric hospitalization may include assertive community treatment (ACT; Marshall & Lockwood, 1998). Results also suggest that as time progresses so does the rate of CJSI among PEHSMI and therefore the earlier the intervention the better. It is important to keep in mind that participants of VAH who provided administrative data consent had experienced homelessness intermittently for an average of 10 years (Rezansoff et al., 2016), and this structural factor in and of itself is associated with CJSI (Constantine et al., 2010; Kouyoumdjian et al., 2019; Roy et al., 2014), requiring intervention. Unsurprisingly, the prevalence of criminal convictions among participants was very high and in the range of lifetime prevalence estimates (Roy et al., 2014). The aforementioned risk factors reinforce the importance of implementing HF as soon as possible for PEHSMI. HF is well-positioned to address each of the aforementioned risk factors as a comprehensive psychosocial rehabilitation intervention.

After being randomized to HF, none of the significant independent variables in Chapter 3 that were included in Chapter 4 were associated with criminal convictions,

except for substance use-related variables and prior criminal convictions. An obvious implication of these results is the need for evidence-based substance use treatment and services, especially given addiction counselling in the month before study randomization was associated with a significantly lower rate of criminal convictions. However, given the importance of feeling a sense of belonging and meaning in one's life as a factor facilitating addiction recovery (Alexander, 2008), inclusion of services in HF that may increase community integration and meaningful activity (e.g., supported employment and social skills training) may also be important in facilitating reductions in substance use in addition to formal substance use treatments and services (e.g., contingency management or opioid agonist treatment).

Many of the psychosocial rehabilitation services described above are already important components of the HF model as described in Chapter 1, but they are not always included in HF programs. Consider the case of supported employment, which is a well-established and evidence-based psychosocial rehabilitation intervention for PESMI (Campbell et al., 2011; Solomon et al., 2011; Warner, 2012). This intervention was not included cross-site in the At Home/Chez Soi study (Poremski et al., 2016). However, vocational-related services play a central role in PRM (Cnaan et al., 1988) and are "essential" (Tsemberis & Asmussen, 1999, p. 128) to HF. Supported employment specifically is included as part of a widely used HF fidelity assessment scale (Stefancic et al., 2013). As mentioned in the previous chapter, the At Home/Chez Soi study was still able to achieve a high fidelity score overall despite weaknesses in specific areas such as employment (Nelson et al., 2014). This begs the question, could it be that some of the null and adverse findings of HF randomized controlled trials were due to weaknesses in specific areas of fidelity? This is a very important issue because subcomponents of HF fidelity have previously been shown to significantly impact housing retention and substance use (Davidson et al., 2014). Overall fidelity scores have also been associated with housing stability, community functioning, and quality of life (Goering et al., 2016). In the At Home/Chez Soi study, participants receiving HF with intensive case management actually had lower odds of competitive employment relative to treatment as usual (Poremski, et al., 2016). It is not unreasonable to expect that this was at least in part due to an absence of supported employment as a formal component of the study's

163

protocol. It is also important to note that the absence of certain interventions in HF or lower fidelity in subscales may have spillover effects on other outcomes not directly related. Staying with the example of employment, vocational services are an important promoter of recovery among people experiencing substance use disorders and have been consistently associated with significantly reduced frequency of substance use and homelessness (Walton & Hall, 2016). Employment has also been shown to be significantly associated with mental health recovery among VAH participants (Yazdani et al., 2020). Ensuring strong fidelity will be important as HF is implemented in other parts of the world.

It is also important to note that, as other researchers have mentioned, there may be other explanations for the null or mixed findings of HF. These explanations include regression to the mean, receipt of health and social services by the comparison group (Kozloff et al., 2016), and inclusion benefit among comparison groups (Aquin et al., 2017). The use of administrative vs. self-reported data may also account for null or mixed results. Furthermore, authors of systematic reviews of HF have mentioned a lack of studies with longer term follow-up (e.g., beyond 48 months; Baxter et al., 2019; Woodhall-Melnik & Dunn, 2016). Some recovery-related outcomes may require longer follow-up periods to detect.

5.3. Implications for future research

Results from chapters 2-4 raise new questions about HF to be answered by future research. It will be important to clarify the reason(s) why first experiencing homelessness in childhood or youth is associated with decreased odds of housing stability in HF as an adult. Qualitative research may be particularly important in revealing these reasons. These may help inform the HF model in terms of additional interventions required or support needs that may be accommodated to increase housing stability. In the meantime, as mentioned earlier, HF programs may consider asking participants their age of first homelessness at the beginning of program enrollment and assess and support independent living skill development and other factors relevant to housing stability. At the same time, it is important to continue to investigate the best housing and support services that

164

facilitate prevention of and exit from homelessness among children and youth so that their homelessness does not extend into adulthood where it may be more challenging to address. As discussed in Chapter 2, such research has only begun among youth (Forchuk et al., 2013; Gaetz, 2014, 2017) and children in families experiencing homelessness (Bassuk et al., 2014; Collins et al., 2019; Gubits et al., 2018; National Academies of Sciences, Engineering, and Medicine, 2018). Including and examining the effect of specific evidence-based substance-use treatments within HF will also be important going forward. Further research on gender is also indicated; the current study lacked adequate power to investigate gender beyond a binary approach.

It will be informative for future research to investigate the impact of specific psychosocial rehabilitation interventions that were not included in VAH nor At Home/Chez Soi, such as supported employment, as such additions may both reduce the occurrence of adverse outcomes as well as disrupt the negative impact of factors significantly associated with adverse outcomes examined in this thesis. However, beyond interventions, the principles of psychosocial rehabilitation and HF specifically are vital components of the model. Strengthening the practices that correspond to these principles and that received lower scores on the At Home/Chez Soi fidelity assessments may not only help facilitate favourable outcomes among clients of HF who have experienced child and youth homelessness, but also those who engage in daily substance use once in the program. As a reminder, some of these "service philosophy" practices include: motivational interviewing, person-centred planning, and reinforcement of social integration, employment, and substance abuse treatment (Nelson et al., 2014).

Tsemberis (2012) argues that for the subset of scattered-site HF clients that "do not manage well" (p. 172) or who would prefer group settings, the option of congregate HF may be more effective. This may also effectively apply to some adult clients who first experienced homelessness in their childhood or youth and for those with CJSI, but this will need to be confirmed via empirical investigation.

Among the models available to integrate the findings of this thesis, the Social Ecological Model has particular promise as it explains behaviour as being influenced by

multiple social levels (i.e., intrapersonal, interpersonal, institutional, community, and public policy levels; McLeroy et al., 1988). Further research using the Social Ecological Model in similar contexts may be fruitful.

More broadly, it is critical to be mindful that HF, despite being a multimodal intervention, is just one intervention. We live in a world with pervasive historical and structural inequities and determinants of homelessness at the population level, some of which include colonization (Anderson & Collins, 2014; Gaetz et al., 2016; Thistle, 2017), discrimination, stigma, and inadequate social-safety net polices (Anthony & Liberman, 1986; Gaetz, 2010). These structural inequities all serve to limit progress in reducing homelessness and will have to be addressed alongside HF for maximal impact (Gaetz, 2010; Hulchanski et al., 2009; Tsemberis, 2012). Within PRM, this is referred to as "societal rehabilitation" (Anthony, 1972; Anthony & Liberman, 1986).

5.4. Conclusions

Analyses of data collected by VAH as well as the IMRI reported in this thesis outline considerable marginalization of participants before recruitment to the study. Some participants continued to struggle with housing instability and CJSI even after being randomized to HF. Original findings of this thesis further indicated specific factors found to be risks for these outcomes.

The next research frontier of HF should involve investigating ways to improve the intervention. There were undoubtedly other adverse outcomes that some participants experienced as well that were beyond the scope of this thesis. It will be important for factors associated with other adverse outcomes to be investigated as they provide clues regarding where to focus additional attention, research, and intervention for improvement. Any additional interventions will also need to be examined regarding their effects.

HF has been remarkable in reducing homelessness among PEHSMI internationally, and this, in itself, is an important justification for scaling the intervention. Fortunately, we are living at a time where national governments are recognizing some of

the devastating consequences of neoliberal cutbacks of the 1980s and 1990s pertaining to homelessness (Hulchanski et al., 2009). Both Canada and the US, for example, have adopted HF in their homelessness strategies (Government of Canada, 2019; United States Interagency Council on Homelessness (USICH), 2018). Moreover, the Canadian Federal Government relatively recently (2017) announced a comprehensive national housing strategy after it was abandoned in the early 1990s (Government of Canada, 2018). Despite limitations of these strategies, they are undoubtedly steps forward in the right direction where reducing homelessness is concerned. Housing is acknowledged as a human right in the Canadian Federal Government's housing strategy, and there is proposed legislation to ensure the Strategy's continuity (Government of Canada, 2018).

A major concern going forward, however, is regarding the implementation of HF, and housing and support interventions in general, as per empirical evidence. It has been reported that most HF programs do not adhere to the original model conceived in New York City (Pleace & Bretherton, 2013). Moreover, Canada's homelessness strategy, called Reaching Home (Government of Canada, 2020), no longer makes the use of HF mandatory (Government of Canada, 2019). The use of ACT is also not required as part of the homelessness strategy and is reflected in the paucity of ACT in Canadian HF programs (Nelson & Aubry, 2018). Another limitation of the Canadian housing strategy is that it only aims to "reduce chronic homelessness by 50%" (Government of Canada, 2018, p. 4) over 10 years. This runs counter to viewing housing as a human right. A lack of evidence guiding government strategy is also present at the provincial level. For example, in 2017, the Government of BC announced a new housing strategy to address homelessness, which entailed building temporary modular housing units involving congregate housing with unspecified on-site supports (Government of British Columbia, 2018; Little, 2017). The more fundamental question is, why not include HF in this strategy? The housing strategy clearly did not include HF because it violated key principles described in Chapter 1, namely having choice in housing, permanence of housing and services, provision of independent apartments in the private market with each building housing no more than 20% of PESMI, and possibly the inclusion of ACT or ICM (Tsemberis, 2015). It also violated the broader principles of PRM also described in Chapter 1, namely self-determination, normalization, and no limits on participation

(Cnaan et al., 1988). Furthermore, it ignores the vast amount of empirical evidence produced regarding HF's effectiveness in increasing housing stability outlined in Chapter 1, including Canada's own federally funded At Home/Chez Soi study (Aubry et al., 2016; Goering et al., 2011; Stergiopoulos et al., 2015).

There is clearly more that needs to be done to improve HF. The independent variables associated with adverse outcomes among PEHSMI highlighted in Chapters 2-4 provide clues for improvement of the intervention. However, despite the limitations of HF's impact on a variety of outcomes, it is highly effective in ending chronic homelessness. Aubry et al. (2016) argues that:

> From a policy perspective, the choice becomes to either implement HF and significantly reduce homelessness while having a modest effect on mental health and addiction or to provide treatment first, then housing, with similar clinical outcomes but inferior housing outcomes. (p. 280)

The most evidence-based choice where PEHSMI are concerned is clear.

5.5. References

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