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Housing interventions for homeless, pregnant/parenting women with addictions: a systematic review

Jessica Krahn [a], Vera Caine[a], Jean Chaw-Kant [a] and Ameeta E. Singh[b]

[a]Faculty of Nursing, University of Alberta, Level 3, Edmonton Clinical Health Academy, Edmonton, Canada; [b]Department of Medicine, University of Alberta, Edmonton, Canada

ABSTRACT

Family homelessness is a growing problem in North America with most of these families headed by single women. Homeless women also experience high rates of pregnancy and addiction (drugs and alcohol). Housing interventions have been identified as key to addressing the complex needs of pregnant/early parenting, homeless women with addictions. The aim of this systematic review is to determine what housing models and programs for this population yield the best outcomes. We systematically searched 10 databases and retrieved eight articles describing four distinct studies that met the inclusion criteria for this review. Overall, improved outcomes were found for all intervention groups with the most recent and rigorous studies favoring models combining Housing First and case management. However, methodological limitations, study quality, and varied outcomes made comparison across studies difficult. Further research must be done in this area using standardized outcomes and rigorous designs to develop evidence-based best practice guidelines to address the unique needs of this population.

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Homelessness; women; pregnancy; housing models; addictions

Background

In Canada and the United States, the rates of family homelessness are rising (Grant, Gracy, Goldsmith, Shapiro, & Redlener, 2013; Gulliver-Garcia, 2016). In Canada, the use of emergency shelters by families grew by over 50 per cent between 2005 and 2009, with most families headed by single women (Gulliver-Garcia, 2016). Between 2012 and 2013, the number of children experiencing homelessness increased by 8 per cent in the United States meaning that 1 in 30 children were homeless and that 37 per cent of the homeless population was comprised of families (Bassuk, DeCandia, Beach, & Berman,2014). The Canadian Observatory on Homelessness (2012) defines homelessness as being either unsheltered (living on the streets or in a place not intended for human habitation), emergency sheltered (staying in shelters intended for people who are homeless or in emergency shelters for those facing abuse), or provisionally (unstably) sheltered (living somewhere temporarily such as with a family member or friend that is not intended to be long term). Multiple housing models currently exist in Canada and the United States for people experiencing homelessness and who also use substances. In this systematic review, we identify and synthesize the available literature to answer the question of what housing models demonstrate an impact for homeless, pregnant, and/or parenting women with addictions.

Homeless women

Women experiencing homelessness encounter significant barriers to achieving mental and physical well-being (Chambers et al., 2014; Teruya et al., 2010). In a cohort study of homeless and unstably housed women living with or at risk of contracting human immunodeficiency virus (HIV), 62 per cent of women experienced violence in childhood and adulthood, 64 per cent were diagnosed with major depressive disorder, 50 per cent were diagnosed with post-traumatic stress disorder (PTSD), and 82 per cent were diagnosed with a substance use disorder at baseline (Tsai, Weiser, Dilworth, Shumway, & Riley, 2015). During the 3-year duration of the study, over 75 per cent had been victimized. The authors conclude that higher rates of victimization and violence were linked to decreases in mental health and increases in subsequent mental health care use. Teruya et al. (2010) found that all homeless women in their study were predisposed to poorer health related to housing instability, limited access to healthcare, high levels of childhood victimization, low self-esteem, and limited resources to meet their needs.

Homelessness and pregnancy

Women experiencing homelessness are significantly more likely to become pregnant than women who are housed (Crawford, Trotter, Hartshorn, & Whitbeck,

CONTACT Jessica Krahn si4@ualberta.ca Faculty of Nursing, University of Alberta, Level 3, Edmonton Clinical Health Academy, 11405-87th Avenue, Edmonton, Alberta T6G1C9, Canada

2011). In a study of homeless youth in the United States, those living on the streets had a lifetime pregnancy rate of 47 per cent compared to youth living at home whose lifetime pregnancy rate was less than 10 per cent (Greene & Ringwalt, 1998). Researchers have found that most homeless pregnant women report their pregnancy as unintended, a finding that can be linked to the relatively low reports of consistent and proper birth control use, increased rates of mental health challenges and/or substance use, high rates of sexual activity, and increased risky sexual behavior (Thompson, Begun, & Bender, 2016). Forced sexual activity and abuse are common among homeless women both before and after becoming homeless (Tsai et al., 2015). Women experiencing homelessness also report the use of sex for survival either by using it to obtain necessities such as money, food, shelter, or to feel closeness and intimacy (Greene & Ringwalt, 1998; Thompson et al., 2016; Warf et al., 2013).

Pregnant women and their infants experiencing homelessness are more likely to experience adverse health outcomes. Researchers analyzing data from 31 states in the United States found that infants born to mothers who were homeless were more likely to have very low birth weights, spend time in the neonatal intensive care unit, have fewer postnatal health check-ups, and were less likely to be breast fed or spend adequate time breastfeeding (Richards, Merrill, & Baksh, 2011). The authors of this study linked poorer birth outcomes with the challenges that homelessness during the prenatal and postnatal periods poses. A recent study by Heaman et al. (2014) found that some of the barriers to prenatal care faced by pregnant women living in inner-city Winnipeg, Canada, include stress, depression, long appointment wait times, lack of transportation, and fear of child apprehension. Other studies have linked adverse birth outcomes with high rates of prenatal stress, which are also correlated with homelessness (Lobel, Dunkel-Schetter, & Scrimshaw,1992).

Homeless mothers

Once homeless women become mothers, they acquire an additional set of unique needs and challenges. Zabkiewicz, Patterson, and Wright (2014) found that the odds of experiencing depression among mothers who had been homeless for at least two years was twice as high compared to non-mothers, and found a similar relationship between parenting status and PTSD. The odds of drug dependence were found to be 2.62 times higher among homeless mothers compared to non-mothers regardless of the duration of homelessness. Bassuk and Beardslee (2014) link high rates of depression among mothers who are homeless to stressful circumstances and histories of trauma, which add to the challenge of effective parenting. A significant contributor to this stress is the realistic fear of child apprehension because children experiencing homelessness are significantly more likely to be separated from their mothers (Dotson, 2011).

Homeless children

The poorer health status found in mothers who are homeless also extends to their children. In a study by Weinreb, Goldberg, Bassuk, and Perloff (1998) children of mothers who are homeless had significantly more visits to the emergency department or outpatient clinic and were more likely to have a fair or poor health status than children who were housed. Homeless children are at a high risk of experiencing stressful and traumatic life events, which have been linked to disrupted development of mental and physical functioning including higher rates of emotional, behavioral, and physical health problems compared to non-homeless peers (Grant et al., 2007; Herbers, Cutuli, Monn, Narayan, & Masten, 2014).

Homelessness and substance use

Researchers have found high rates of drug or alcohol dependence in homeless or precariously housed women, including those who are pregnant or parenting (Bassuk, Buckner, Perloff, & Bassuk, 1998; Chambers et al., 2014; Tsai et al., 2015). Higher rates of drug and alcohol use among women who are homeless have been positively correlated with abuse by substance using partners, various forms of abuse in childhood and adulthood, subsequent PTSD, and social environments that portray substance use as "normal" (Salomon, Bassuk, & Huntington,2002; Tyler & Melander, 2015; Wenzel et al., 2009). Intravenous drug users (IDUs) who are homeless have a significantly higher risk of contracting HIV than IDUs who are housed (Coady et al., 2007; Des Jarlais, Braine, & Friedmann, 2007). While homeless women already face many barriers to accessing health care (Teruya et al., 2010), pregnant women and mothers with substance use disorders are even less likely to access health care out of fear of child apprehension, shame, and fear of treatment from service providers based on the stigma attached to substance use in motherhood and pregnancy (Racine, Motz, Leslie, & Pepler, 2009).

Housing models for people experiencing homelessness and addictions

Because of the hostile conditions faced by women living in the streets, housing along with supports that facilitate remaining housed have been identified in many studies as foundational to meeting women's and their children's needs (e.g. Bassuk & Beardslee, 2014; Herbers et al., 2014). Multiple housing models currently exist in Canada and the United States for

people experiencing homelessness and who are using substances. Most models are based on some form of case management, Continuum of Care, or Housing First approach/philosophy (Marshall & Kerr, 2014).

There are many models within the case management approach. Generally, a caseworker or multidisciplinary team is assigned to an individual, whereby the team works with the client to identify their strengths and needs, and to connect the individual with relevant and necessary supports including addictions support, psychiatric support, medical care, life skills training, and housing (de Vet et al., 2013). Case management is often combined with Continuum of Care or Housing First philosophies to provide support for clients until they can "graduate" from the program (Remaeus & Jönsson, 2011). In Continuum of Care programs (also known as the Linear Approach), individuals wanting to obtain housing must move through multiple "steps" of addictions recovery and housing independence with the final goal being abstinence and the ability to live and function independently. Although the approach varies, a Continuum of Care approach might start with an emergency shelter, then move to supportive housing, supported housing, and finally independent housing for which abstinence is a requirement (Wong, Park, & Nemon, 2006). Housing First is often seen as the opposite of Continuum of Care programs because housing is viewed as a fundamental right regardless of individual housing "readiness" and is provided and maintained without the requirement of client change in their use of substances or mental illness symptoms. The Housing First model adopts a harm reduction approach and reasons that meeting the basic need for housing will lead to improvement in all areas of life (Marshall & Kerr, 2014).

Objectives

The effectiveness of the above housing models has been studied with people facing homelessness and addictions/mental illness (e.g. Stergiopoulos et al., 2015; Woodhall-Melnik & Dunn, 2015); however, very few studies exist comparing and evaluating the models specifically on their efficacy and impact for pregnant and/or early parenting women with addictions who have a history of homelessness. At the same time, women-specific programing and supports are essential because of their unique gender-specific needs and challenges (Bassuk & Beardslee, 2014; Chambers et al., 2014). In this paper we summarize and synthesize the available evidence for the efficacy of the various housing models and programs that are present in current research literature.

Methods

With the assistance of a librarian, a search strategy was developed to identify studies on housing models for homeless pregnant and/or parenting women with addictions. The following databases were searched: Medline, CINAHL, Embase, PsycINFO, SocINDEX with Full Text, Social Work Abstracts, Academic Search Complete, Proquest Dissertations and Theses Global, Web of Science Core Collection, and Scopus using the keywords: "substance use", "homelessness", "motherhood and/or pregnancy", and related terms. See Appendix 1 for the full search strategy. Publications were restricted to English; no date or country limitation was set. Researchers known by the authors to work in the field of interest were also consulted for any relevant studies and, whenever possible, known Canadian programs for the population were contacted for any unpublished reports.

After removing duplicates retrieved from the search, the remaining abstracts were screened by two reviewers for relevance to the current study (JK & JCK). Any disagreement on the inclusion of an article was discussed between the two reviewers and a third reviewer (VC) was consulted if a conclusion could not be reached. Once both reviewers agreed that the article met the inclusion criteria, the full text was read and the quality of the evidence was evaluated using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist for quantitative studies (Vandenbrouckel et al., 2007) and the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist for qualitative studies (Tong, Sainsbury, & Craig, 2007). We conducted the review according to Preferred Reporting Items for the Systematic Review and Meta-Analysis (PRISMA) guidelines and used the PRISMA tool to guide our review process and the synthesis of our results (Moher, Liberati, Tetzlaff, & Altman, 2009). Figure 1 shows the PRISMA flow diagram of the search strategy and reasons for study exclusion.

Study inclusion

To be included in this review, studies needed to evaluate, through primary research, participant outcomes of the model. Articles that described housing models and/or the need for programing without evaluating them were excluded. Our interest was in housing programs that provided access for at least a year, thus excluding a focus on shelters or temporary housing programs. Using Slesnick and Erdem's (2013) definition, a housing model was defined as an organized program for homeless pregnant/parenting women who use substances that provided them with transitional or permanent housing. Addictions included substance use disorders of either licit or illicit substances including alcohol; programs that focus solely on addiction recovery were excluded.

Results

The initial database search yielded a total of 710 articles that were potentially relevant to our study. Once

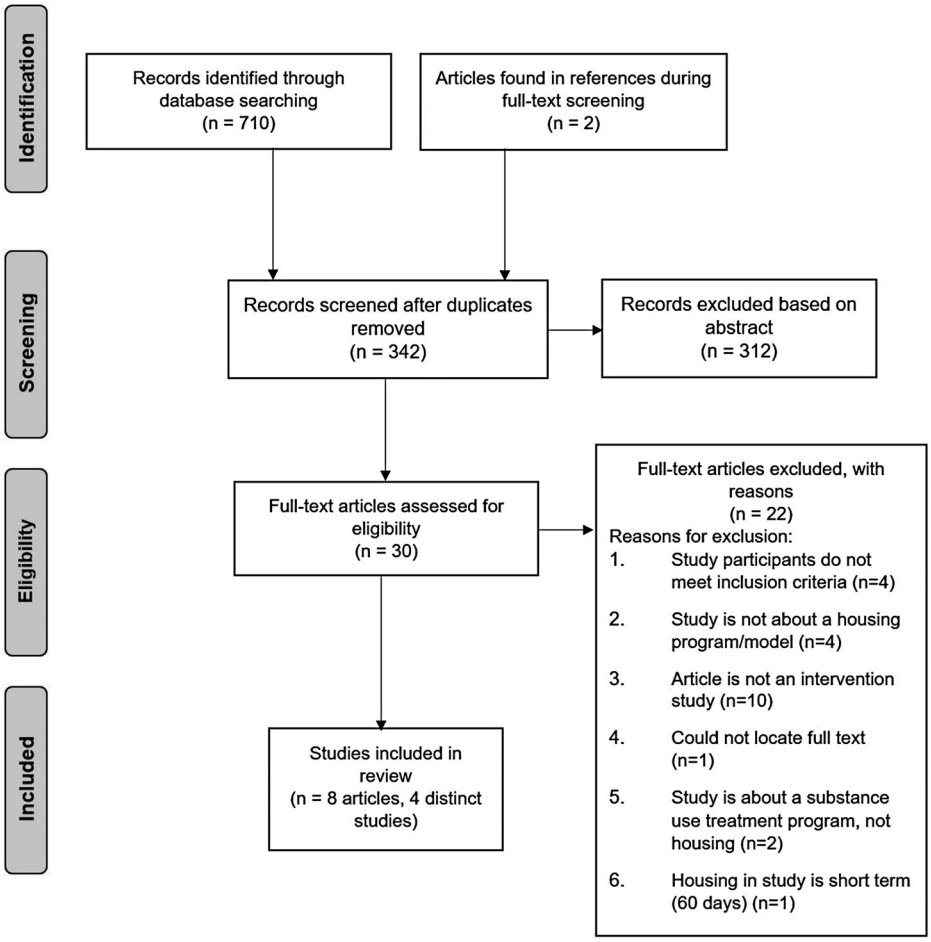

Figure 1. PRISMA flow diagram of search strategy.

duplicates were removed 340 articles were retained. Consultation with researchers in the field yielded no relevant studies and there were no additional program evaluations identified through contacting the programs directly. Articles remaining from the abstract screening by two independent reviewers numbered 28. Inter-rater reliability between the two reviewers was high with the percentage of agreement measuring 98.6 per cent and a Cohen's Kappa score of .912. After reading the full text of the remaining articles and evaluating them, six articles were found to meet inclusion criteria. The references and other works by the authors of the remaining studies were searched to identify any additional articles, adding two articles which were screened and found to meet inclusion criteria, yielding a total of eight articles describing four distinct studies to be included in the review.

We used a data extraction tool to synthesize the variables of the studies including each study's location, sample size, control group/comparison, study inclusion criteria, study design, housing intervention model, main outcome measures, and results. The summaries of the data extracted from the included studies are presented in Table 1. For clarity, the included studies will be referred to by their distinct intervention models in the remainder of this review.

Housing program models

All four housing models evaluated in the included studies varied in their housing and support service models, often combining aspects of different housing philosophies and support programs.

Supportive Housing for Families with Intensive Case Management (SHF with ICM)

The SHF with ICM program included "intensive case management as well as access to statewide scattered-site permanent housing, mental health and related interventions, housing, employment and vocational assistance, and support for building community" (Farrell et al., 2012, p. 257). Case managers met with families to develop a care plan specifying strengths, needs, client activities, agency supports, and addressed family goals. Clients received 10 h of direct interaction with their case managers per month. This housing program was not open to women actively using substances, women with severe and persistent mental illness or intellectual disabilities, or women at risk of harm. While the program excluded women who actively used substances at the time of program enrollment, women with known substance use disorders were allowed to participate and mental health and

Table 1. Description of included studies.

Intervention and Location	Inclusion Criteria	Study Design	Sample Size	Control/ Comparison Condition	Study	Outcomes Measured	Results
- Supportive Housing for Families (SHF with ICM): - Intensive case management - Nationwide scattered site housing - Mental health interventions - Housing, employment and vocational assistance - -Community building support - Connecticut, USA	- Individuals - Head of household - History of substance use - In child welfare system - Housing as barrier to maintaining family unit - Not actively using substances	- Mixed methods: -22 item patient engagement measure administered once to subgroups of clients enrolled in the program for 3, 6, 9, and 12 months - Single semi-structured interviews	$N = 41$ (1 male and 40 female clients)	Not applicable	Farrell, Luján, Britner, Randall, and Goodrich (2012)	- Level and nature of client engagement with program - Validity of patient engagement measure	- High program engagement - Engagement related to prompt, tangible outcomes (e.g. Housing) and resourceful and responsive case workers - Interview results validated client engagement measure outcomes
- Homelessness Prevention Therapeutic Community (HP-TC) for addicted mothers and their children with enhanced programing on: - Parenting - Work - Building supportive community - Housing stabilization interventions - Pennsylvania, USA	- Mothers - Homeless (or at risk of homelessness - Using substances	Quasi-experimental, non-equivalent groups	- $N = 148$ (Experiment: $n = 77$, Control: $n = 71$) - After propensity analysis only medium propensity group was analyzed (Experiment: $n = 28$, Control: $n = 21$)	Traditional Therapeutic Community (TC) TC using mutual-self- help and peer community to facilitate change	Sacks et al. (2004)	- Parenting - Housing stabilization - Substance use - Criminality - HIV risk behavior - Employment/ economic resources - Trauma/abuse - Psychological distress - Family/friends/ community - Health/ treatment	- Overall positive and significant treatment effect favoring the experimental group - Significantly better outcomes in experimental group in 2/10 domains (psychology and health) - Consistent pattern of improvement across 6/8 remaining domains
- Family Critical Time Intervention (FCTI): - 9-month community based case management model - Scattered-site housing and service linkages throughout families' transitions to community housing - Mothers not required to meet "readiness" requirements to receive housing - Families received continuous case management from one case worker trained in FCTI throughout the 9-month intervention - Caseloads for FCTI workers did not exceed 12 clients	- Mothers - Diagnosable mental illness or substance use disorder - Caring for at least one child between 1.5 and 16 years old	Longitudinal randomized control trial with standardized assessments at baseline, 3, 9, and 15 months	$N = 210$ families (FCTI: $n = 97$, TAU: $n = 113$)	- Treatment as usual (TAU) system with many well-coordinated services. - Caseworkers were reassigned during and after shelter stays and had caseloads between 24 and 48 families - Families moved into permanent housing only after meeting "standards for housing readiness" (p. 206).	Samuels, Fowler, Ault-Brutus, Tang, and Marcal (2015)	- Maternal mental health - Mental health service use - Housing experiences	- FCTI participants housed faster than those in TAU - Mental health improved in both treatment groups when provided with affordable housing without significant differences between groups
		Randomized trial with standardized assessments at baseline, 3, 9, 15, and 24 months	- $N = 200$ families (FCTI: $n = 97$, TAU: $n = 103$ in usual care) - $N = 311$ children		Shinn, Samuels, Fischer, Thompkins, and Fowler (2015)	- Children's mental health outcomes - School performance and experiences - Housing	- Improvements seen in both groups, especially in mental health - Authors suggest that stability in children's lives might lead to improved mental health and school outcomes - FCTI directly improved some child outcomes and accelerated improvements that were associated with the passage of time.

(*Continued*)

Table 1. Continued.

Intervention and Location	Inclusion Criteria	Study Design	Sample Size	Control/ Comparison Condition	Study	Outcomes Measured	Results
- Westchester County, NY, USA							
- Ecologically Based Treatment (EBT): - Non-abstinence continent scattered site housing of mother's choice - 3 months of rental and utility assistance (up to $600) - 6 months of case management and substance abuse therapy (Community Reinforcement Approach) all provided by one therapist. - Large, Midwest city in the USA.	- Homeless - Parenting child between 2 and 6 years old - Meet the DSM-IV criteria for substance abuse or dependence	- Non-randomized pilot with - Interviews at intake, 3, and 6 months	$N = 15$	Not applicable	Slesnick and Erdem (2012)	- Housing - Substance use - Mental health - Employment - Child behavioral problems - Parenting stress - Intimate partner violence (IPV)	- Mental health symptoms, substance use, and children's internalizing/externalizing problems significantly improved - Two thirds of mothers maintained their housing 3 months after rental assistance ended
		Randomized clinical trial with evaluation at intake, 3, 6, and 9 months	$N = 60$ (EBT: $n = 30$, TAU: $n = 30$)	Services through a temporary shelter using rapid re-housing and rich in coordinated services	Slesnick and Erdem (2013)	- Housing - Substance use	- Independent living days increased, and substance use decreased faster in the EBT group - Differences between groups disappeared at 9 months - Housing was associated with reduced substance use
					-- Guo, Slesnick, and Feng (2016)	- Maternal mental and physical health - Child problem behaviors - Self-efficacy - Parenting stress - IPV	- Mothers in EBT reported reductions in children's internalizing and externalizing behavior problems - Reductions in mothers' mental health problems and IPV were seen in both conditions
					-- Erdem (2014)	- Fundamental dimensions of human development analyzed through Sen's capabilities lens - Six domains of basic capabilities: - Safety/physical security - Material well-being, health, empowerment/ agency - Social integration	- Treatment effects suggested only for independent living days - Both conditions reported feeling happier, improved health, and fewer difficulties meeting their basic needs even while social integration and employment did not improve - Both had higher self-efficacy, and experienced less IPV - Subjective well-being was associated with independent living days, levels of self-efficacy, and decreases in IPV.

addictions services were provided throughout the program.

Homelessness Prevention Therapeutic Community (HP-TC)

Sacks et al. (2004) evaluated a modified Therapeutic Community (TC) for homeless, mentally ill, chemically abusing individuals with adaptations for mothers and their children and to prevent homelessness (Homelessness Prevention TC; HP-TC). TCs are residential self-help alternatives to conventional addictions treatment and are founded on the 12-step model of Alcoholics Anonymous. TCs view drug use as a disorder of the whole person and thus aim to change participants' values and entire lifestyles, rather than just reduce substance use. As comprehensive psychosocial interventions, TCs are designed to treat substance use and promote change in psychological functioning and social behavior (De Leon, 2000). In addition to traditional TC programing and principles, the HP-TC included modified interventions addressing parenting, preparation for employment, housing stabilization, and building a supportive community.

Family Critical Time Intervention (FCTI)

The Samuels et al. (2015) and Shinn et al. (2015) articles evaluated a program using Family Critical Time Intervention (FCTI) which provided community-based case management in three distinct phases for a total of nine months. During phase one the case manager identified family needs and provided connections to appropriate community resources. During the second stage, the caseworker and family worked to test and adjust community support systems while working to secure and maintain stable housing. In the third stage, adjustments were made to ensure the long-term establishment of community supports addressing family functioning and housing. FCTI case management existed to strengthen ties between families and community support services, repair and strengthen maternal relationships with family and friends, and to provide emotional and practical support during the transition between homelessness and housing. In addition to FCTI case management, families were provided with scattered-site housing without time limits and without needing to meet caseworker's "housing ready" criteria (Samuels et al., 2015).

Ecologically Based Treatment (EBT)

In the EBT housing model evaluated by Slesnick and Erdem (2013), mothers were provided with an independent apartment of their choosing with utility and rental assistance up to $600 for three months that was not contingent on drug abstinence or treatment attendance. The EBT model included case management for six months or up to 26 case management sessions. The case management component of EBT "focused on assisting mothers to meet their basic needs (e.g. referrals to food pantries) and helping them obtain government entitlements (e.g. SSDI/SSI, cash assistance, food stamps, Title XX for child care)" (Guo et al., 2016, p. 4). Caseworkers also delivered substance use treatment through the Community Reinforcement Approach (CRA) throughout the six months (Meyers & Smith, 1995). Caseworkers were described as "always on-call for potential crisis and urgent needs" (p. 5) and offered services within clients' homes (Guo et al., 2016).

Study designs, quality, and outcomes measured

The designs, rigor, statistical strength, and outcomes measured in the included studies varied greatly.

SHF with ICM

The SHF with ICM study used a mixed-methods cross-sectional design. Researchers gathered data from questionnaires and interviews from participants who were in the program for 3, 6, 9, and 12 months (Farrell et al., 2012). This design was used to measure client engagement in the program as well as to validate the engagement questionnaire used in the study. The authors of the study suggested that higher levels of engagement would be correlated with improved program outcomes, however, because the study did not measure these outcomes and did not follow the trajectories of participants for any length of time, including program retention, these predictions were not tested. Results of the engagement questionnaire and client interviews indicated that engagement with the program was high and that this was found to be primarily due to access to and communication with their caseworkers who first helped to access housing followed by community-based services and supports. Due to the lack of randomization and a control group, in addition to a small sample size of 41 participants, it is difficult to draw conclusions from this study beyond this model of case management being promising for increasing client engagement.

HP-TC

The HP-TC model was evaluated in a quasi-experimental, non-equivalent control group study (Sacks et al., 2004). This study included most of the items on the STROBE checklist used to evaluate the quality of the evidence for quantitative studies in this review. The study design was described in detail and statistically adjusted for non-equivalences between groups studied. After using propensity scores to stratify the groups and selecting only the medium propensity group for analysis, the study only analyzed outcomes for 49 participants (Experimental = 28, Control = 21) and had low statistical power. The outcomes measured in this study included parenting, housing stabilization,

substance use, criminality, HIV risk behavior, employment/ economic resources, trauma/abuse, psychological distress, family/friends/ community, and health/ treatment.

FCTI

The FCTI model was studied using a longitudinal randomized clinical trial (RCT). This study included the highest number of participants of all included studies (experimental = 100 families, control = 123 families) and scored high on the STROBE checklist. Control and experimental groups were stratified according to family size and randomly assigned to each condition. Fidelity to the FCTI model was monitored and ensured throughout the study. The outcomes of this RCT are reported in two studies, Samuels et al. (2015) and Shinn et al. (2015), with the former reporting maternal mental health outcomes, mental health service use, and housing experiences and the latter reporting children's mental health outcomes, school performance and experiences, and housing.

One limitation of Samuels et al.'s (2015) report on maternal mental health outcomes was their difficulty obtaining baseline mental health scores because women in the program were recruited from shelters, a situation inflicting significant stress which was then taken away in both the control and intervention groups. This absence of a true baseline makes ruling out alternate explanations beyond re-housing for improvements in maternal mental health challenging.

EBT

The EBT housing program was evaluated in two related studies by the same authors. The first was a non-randomized pilot study (Slesnick & Erdem, 2012) which was followed by an RCT (Slesnick & Erdem, 2013). The results of the pilot study are described in one article (Slesnick & Erdem, 2012), and the results of the RCT are described in three articles analyzing different outcomes of the EBT model (Erdem, 2014; Guo et al., 2016; Slesnick & Erdem, 2013). In this review, we focus mainly on the results and study design from the articles analyzing the results of the RCT, not the pilot study, because the results are in alignment with and expand on those in the pilot study. The Slesnick and Erdem (2013) RCT scored highly on the STROBE checklist and the control and experimental conditions were matched at baseline. In addition, fidelity checks were conducted to ensure proper implementation of the experimental condition and follow-up rates were high (100 per cent in experimental, 80 per cent in control). The randomized study had a small sample size (Experimental = 30, Control = 30), yielding low statistical power. The measured outcomes across all articles analyzing the RCT include housing, substance use (Slesnick & Erdem, 2013), maternal mental and physical health, child problem behaviors, self-efficacy, parenting stress, intimate partner violence (Guo et al., 2016), and six domains of basic capabilities (Erdem, 2014).

Housing program outcomes comparison

Although none of the included studies had identical measured outcomes or measurement tools, some overlap exists in the areas of housing stability, maternal mental health, children's mental health, substance use, and parenting.

Housing stability

HP-TC. The HP-TC study measured housing stability by the number of residences and days in each type of residence at the 12 month follow up (e.g. own apartment, doubled up, shelter, etc.) (Sacks et al., 2004). No significant differences were found in housing stability between groups at the domain or factor level. When analyzed at an item level, some measures favored the control (C) group and others the experimental (E) group. The authors suggest that these results are indicative of the multi-faceted and complex phenomenon of functional homelessness.

FCTI. The FCTI study used a structured residential follow-back instrument to provide timelines of the places where participants lived before and during the 15 month study period (Samuels et al., 2015; Shinn et al., 2015). Ninety-eight per cent of families in the E group and 84 per cent of the C groups transitioned from shelter to housing during the study period. The average number of days it took for E families to move into stable housing was 91.25 days (SD = 82.3) whereas it took an average of 199.15 days (SD = 125.4) for families in the C group.

EBT. The EBT study administered a housing form at follow-ups to assess whether participants attained and/ or maintained housing assistance or related services. It also documented income resources and government benefits received to maintain housing (Slesnick & Erdem, 2013). Mothers in both conditions reported increasing numbers of independent living days over time, with gradual deceleration of the increase by the nine month follow up. Mothers in the E group initially had a more rapid increase in independent living days compared to the C group, but a more rapid decrease in independent living days by the nine month follow up where no treatment differences were found. The follow-up rate with the EBT group was 100 per cent compared to the treatment as usual (TAU) group, indicating the possibility that those in the EBT group experienced more life stability and service connection (Slesnick & Erdem, 2013).

Maternal mental health

HP-TC. The HP-TC study used the *Beck Depression Inventory–II* (Beck, Steer, & Brown, 1996), the

Symptom Check List 90-Revised (Derogatis, 1983) and, the *Addiction Severity Index* (McLellan et al., 1992) to assess maternal mental health outcomes (Sacks et al., 2004). The authors found significantly better outcomes in the E group with a Hedges g effect size of 0.24 ($p < .001$).

FCTI. The FCTI study used the *Brief Symptom Inventory* (Derogatis, 1993) to compute the Global Severity Index (GSI) of their participants at each stage (Samuels et al., 2015). GSI scores decreased from 58 at baseline to 49 at the 15 month follow-up in both E and C groups (scores under 50 fall within the "normal" range) indicating no significant treatment differences and that these improvements were associated with the provision of stable housing and the passage of time, not case management interventions.

EBT. The EBT study used the *Short-Form-36* (Ware, Snow, Kosinski, & Gandek, 1993) which consists of sub-scales to measure physical health and mental health, as well as the *Beck Depression Inventory-II* (Beck et al., 1996). Significant improvements were seen in both conditions in depressive symptoms and mental health. Effect sizes in both conditions were greater than 0.7 (Guo et al., 2016).

Children's mental health

FCTI. The FCTI study found that 15 per cent of children's mental health outcomes were directly improved or accelerated in the FCTI group (Shinn et al., 2015). They measured children's internalizing behaviors (negatively affecting the child's internal environment such as withdrawn, anxious, inhibited, and depressed behaviors) and externalizing behaviors (negatively affecting the child's external environment including hyperactive, disruptive, and aggressive behaviors) using the *Child Behavior Checklist*, *Youth Self-Report*, and *Teacher Report Form* (Achenbach & Rescorla, 2001; Liu, 2004; Shinn et al., 2015). They also used the *Children's Depression Inventory* (Kovacs, 1992). Assignment to FCTI rather than TAU led to improvements in internalizing (mean effect size: 0.4) and in externalizing (mean effect size 0.2) behaviors for children ages 1.5–5. No effects were observed for most of the other outcomes, however, the treatment effects that were found favored the treatment group and occurred across different reporters (children, mothers, and teachers).

EBT. The EBT study also measured problematic internalizing and externalizing behaviors using the $ChildBehaviorChecklist/1\frac{1}{2}-5$ (Achenbach & Rescorla, 2001; Guo et al., 2016). The authors found significant reductions in children's internalizing behaviors and externalizing behaviors in E group (effect size = 0.61, 0.62, respectively) compared to C group (effect size = 0.16, 0.34, respectively).

Substance use

HP-TC. The HP-TC study measured any illegal drug use, frequency of use and number of days of use, number of different types of illegal drugs used, and types of alcohol and drug use impacts (Sacks et al., 2004). They found no significant differences between E and C groups.

EBT. The EBT study used the *Form 90 Interview* (Miller, 1996) to measure the frequency and quantity of drug and alcohol use in the last 90 days and confirmed these responses by testing participants' urine samples (Slesnick & Erdem, 2013). They also measured problem consequences of substance use using the *Inventory of Drug Use Consequences* (Tonigan & Miller, 2002). Significant reduction in the frequency of alcohol use over time with a slight increase at post-treatment was found. Mothers in the E groups showed a quicker decline, however, treatment effects were the same in both groups at nine month follow up. Mothers reported using drugs less frequently over the six months, with a slight increase at the 9 month follow-up. No treatment differences were found in drug use. After controlling for housing assistance, no association was found between treatment and substance use, meaning that women who were housed at three months reported decreased substance use, regardless of treatment condition.

Parenting

HP-TC. The HP-TC study used the *Parenting Stress Index* (PSI; Abidin, 1995), number of children in residence, number of children financially supported, and Department of Human Services (DHS) interventions to evaluate the parenting domain (Sacks et al., 2004). Overall, no significant differences were found in the parenting domain between groups. When further broken down, better outcomes emerged on three items (PSI distractibility, adaptability, etc.; number of kids residing and supported; and DHS actions) and worse outcomes on two items (PSI isolation, health depression, etc.; and PSI attachment, acceptability, etc.) for the E group compared to C, although none of these were significant. Women in the HP-TC group had more than twice as many children living with them after 12 months, which the authors suggest as a possible cause of their increased parenting stress leading to effect sizes favoring the control group in this domain.

EBT. The EBT study used the *Parenting Stress Index Short Form* (Abidin, 1995) and found that neither condition showed significant improvements in parenting stress (Guo et al., 2016).

Discussion

Although providing housing combined with supportive services for pregnant/early parenting women using

substances has been identified as crucial to improving life outcomes for women and their children by many community stakeholders and researchers, the provision and evaluation of these services are challenging due to the complex and heterogeneous needs of the population. All the programs identified in this review recognized the complexity of the situations faced by this population, and took steps to address these issues through the provision of housing and through additional support, including the peer support in FCTC (Sacks et al., 2004) and various forms and intensities of casework and counseling (Samuels et al., 2015; Slesnick & Erdem, 2013). The results of the studies affirm the value of these programs as they provide housing and other supports which were associated with significant improvements in many domains including mental and physical health for mothers and children, engagement in supportive services, mother's perceived self-efficacy, and decreases in intimate partner violence. However, because of a lack of standardized outcome measure domains and tools, varying study designs and quality, as well as differences in population characteristics across studies, it is difficult to determine whether one housing/program model consistently meets the needs of this population best and produces the best outcomes. After a broad analysis of the included studies, some trends were seen that indicate program models and characteristics that show promise when working with parenting/pregnant women experiencing homelessness and using substances.

Housing First: the importance of providing timely, tangible housing supports

Following the Housing First model by providing rapid access to housing regardless of "housing readiness" was found to be a promising intervention for this population in the EBT and FCTI RCTs (Samuels et al., 2015; Slesnick & Erdem, 2013). In both studies, little difference was found between control and treatment groups; however, in both conditions, clients were given access to housing in a timely way (within three months) and were in resource-rich family shelter systems, with the control group in the EBT study having access to a rapid re-housing intervention "considered a national model for ending homelessness among families" (Slesnick & Erdem, 2013, p. 424). In both studies, when the treatment group was given access to housing before the control group and was not required to meet "housing ready" criteria, outcomes were equal if not superior to the control group. These findings indicate that preventing pregnant/parenting women with addictions from accessing housing because of a lack of treatment compliance or poor mental health, prevents them from reaping the benefits associated with getting off the streets. The authors of the EBT study suggest that housing itself is associated with significant improvements in many domains for mothers experiencing homelessness, mental illness, and problematic substance use. They also suggest that the more rapid decrease in substance use and mental health problems associated with rapid access to housing might also have positive cost implications, including reducing the cost of shelter stays (Slesnick & Erdem, 2013).

Although the SHF with ICM program did not follow the Housing First model, the findings of this study support Housing First principles of rapid re-housing as they found that the key to engaging clients with case managers and programing was to provide access to tangible housing supports first and then provide access to community-based services and supports to address obstacles to keeping the housing (e.g. substance use treatment, vocational/educational counseling). These findings, as well as those in the studies employing Housing First philosophies, are in alignment with the findings of Housing First studies conducted on different and less specific populations (e.g. Stefancic & Tsemberis, 2007), that the resolution of homelessness significantly reduces stressors, allowing for more effective and positive coping.

Case management: the importance of additional supports and positive, supportive, collaborative, and resourceful relationships

Case management was a key component of the SHF and ICM, FCTI, and EBT studies and was associated with significantly improved outcomes (e.g. maternal and child mental health, housing stability, reductions in intimate partner violence, reductions in substance use) for both control and experimental groups in the FCTI and EBT RCTs. This approach, which provided linkages to other supportive services in combination with timely access to affordable and stable housing, appears to be an effective way to transition families from homelessness to housed community living (Samuels et al., 2015; Slesnick & Erdem, 2013).

Because of the complexities of motherhood in combination with homelessness and substance use, the studies employing case management suggested that additional supports must be provided to maintain housing stability and further improve maternal and child outcomes long term (Shinn et al., 2015; Slesnick & Erdem, 2013; Farrell et al., 2012). Although it is difficult to determine which case management approaches (e.g. FCTI vs. EBT) are most beneficial, both the FCTI and EBT studies found that the children in their experimental groups showed some significantly better mental health outcomes when compared to their control groups. This suggests that some types of case management might be more beneficial for families than others; however, more research needs to be

conducted in this area in to determine what features of these interventions are responsible for improved outcomes and how. The improvements in outcomes found across control and intervention groups receiving some form of casework with linkages to services in addition to housing, support Karim, Tischler, Gregory, and Vostanis (2006) suggestion that, although providing housing might alleviate the stressors experienced while homeless, it does not address the complex factors leading to homelessness in the first place. Necessary supports to promote stability might include linkages to child care so that mothers can work, and/or housing subsidies so that mothers have the option to be home with their children or have the time to pursue treatment for substance use and other mental illnesses. Other practical supports might include food or transportation vouchers and linkages to community groups that enhance positive support networks. Because past and recurrent trauma is also often a significant part of homeless women's experiences, services and supports that are trauma-informed might also be necessary to enhance positive coping.

Client engagement was maximized when case managers provided tangible housing supports and then supports to enhance housing stabilization for families in the SHF with ICM program described by Farrell et al. (2012). Interpersonal characteristics including responsive, supportive, resourceful, knowledgeable, and available caseworkers were essential to client engagement and satisfaction with the program. These findings are supported by qualitative work done by Sznajder-Murray and Slesnick (2011), that found feelings of judgement and misunderstanding by service providers were barriers to homeless, substance-using mothers' engagement with their services and that mothers were left wanting more guidance and support which, for them, were indicators of service providers' interest and care. If case management is to be maximally engaging and effective, service providers should be prepared to develop collaborative relationships with their clients and be adequately trained in how to navigate and connect clients to relevant services and respond to their needs in a timely manner.

Research gap

The lack of research being conducted on housing programs specific to the population of pregnant/parenting women experiencing homelessness and using substances was a theme that emerged and was threaded throughout our search and was expressed in almost all included studies. This raises concerns about the efficacy of the numerous programs and models that exist in North America because there is little evidence being produced to support the models employed by these programs that is specific to this population. Without conducting rigorous research, it is difficult to determine whether these programs truly meet the needs of this complex population. We question whether the limited number of retrievable studies is due to evaluations of housing studies not being publicly accessible. This is problematic as, even if results are not favorable, dissemination of knowledge about successes and failures is crucial for the development of effective programs.

Another gap identified after reviewing the included studies is the lack of explicitly stated theoretical foundations for housing interventions for homeless, pregnant/parenting women with addictions. Social and behavioral theoretical foundations hold the possibility to guide interventions and their evaluation in systematic ways; programs which are built on theoretical foundations are more effective (Glanz & Bishop, 2010).

Limitations

Although this review followed PRISMA (Moher et al., 2009) guidelines to achieve maximal rigor, its conclusions have some limitations. First, only four studies were included in our review at the end of our search process; all studies were conducted in the United States. This most likely indicates that research about housing models for this population is limited; however, it is also possible that our search did not retrieve all relevant studies since our search was limited to articles published in English. In addition, our search of the grey literature did not retrieve any additional studies; however, there might be unpublished evaluations of programs that meet our inclusion criteria that were not identified and included in this review.

As almost every study used different outcomes to indicate success and different tools to measure these outcomes, comparison across studies to determine which programs were most efficacious was another challenge. Some of the included studies also identified the need for measures validated specifically for this population. For example, the authors of the FCTI study, Samuels et al. (2015), expressed concern that their initial tool used to identify Axis I diagnosis of mental illness and/or substance use (Mini International Neuropsychiatric Interview) might not have been able to distinguish between an Axis I diagnosis and the negative experiences of being homeless. It would be beneficial for future research to identify and validate tools to measure relevant outcomes for programs specific to pregnant/parenting women experiencing homelessness and problematic substance use. Once relevant tools have been identified, evaluators could standardize and employ these measures so that comparisons across programs' outcomes can more easily and accurately be drawn. Because only two of the four included studies analyzed children's outcomes from the interventions (Guo et al., 2016; Shinn et al.,

2015), this is clearly another area where future research should focus.

Conclusion

The findings of this review illustrate that there is an insufficient evidence base to determine superiority of one housing program for homeless, pregnant/parenting women using substances over another. This is due to the extremely limited availability of published primary research and the limited statistical strength of the studies that do exist evaluating programs in this area. The most rigorous and recent studies in this review were of programs adopting various forms of the Housing First approach combined with case management which demonstrated promising positive impacts for this complex population. To fill in the current literature gap, we suggest that more research should conducted in this area with standardized outcomes and measurement tools to definitively determine what program models and housing types are most beneficial for homeless, pregnant/ parenting women using substances. To improve the generalizability of findings to other settings, evaluations done in countries other than the United States would also be beneficial.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Jessica Krahn is a third-year student in the Bachelor of Science in Nursing program at the University of Alberta. She is interested in social inequity issues, especially homelessness and women's health.

Vera Caine is a Professor in the Faculty of Nursing at the University of Alberta. She is also a CIHR New Investigator. Her research focuses on the Social Determinants of Health and Health Equity.

Jean Chaw-Kant is a project coordinator at the University of Alberta where she works closely with Vera Caine.

Ameeta E. Singh is an Infectious Disease Physician, as well as a Clinical Professor at the University of Alberta. She maintains a general infectious diseases practice at the Royal Alexandra Hospital and a HIV/STI outpatient practice at the Edmonton STI Clinic and the Edmonton Institution for Women.

ORCID

Jessica Krahn http://orcid.org/0000-0002-0829-2912
Jean Chaw-Kant http://orcid.org/0000-0003-1249-3669

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Appendix 1: Search strategy in Ovid Medline.

1. exp Substance-Related Disorders/
2. ((substance or drug* or alcohol* or cocaine or meth or methamphetamine or amphetamine or crack or heroin or opiate* or opioid* or narcotic* or morphine or mari#uana or cannabis or hash* or lsd or hallucinogen* or inhalant* or oxycodon* or vicodin or codeine or fentanyl) adj3 (abus* or addict* or dependen* or misus* or withdrawal or overdose* or detox* or user* or disorder*)) or drinking or inhalant* or ((illicit or illegal or street) adj2 (drug* or substance*))
3. 1 or 2
4. exp Housing/
5. housing or residence or dwelling* or home or homes OR shelter* or Crabtree Corner or Herway Home or Maxxine Wright Shelter or Sheway or Valeda House or Villa Rosa or Humewood House or Supportive Housing for Young Mothers or SHYM
6. 4 or 5
7. 3 and 6
8. pregnan* or mother*
9. 7 and 8
10. exp Homeless Persons/ or homeless*.mp.
11. 9 and 10
12. limit 11 to English language