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Intervention for Homeless, Substance Abusing Mothers: Findings from a Non-Randomized Pilot

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Abstract

Little empirically-based information is available regarding how best to intervene with substance-abusing homeless mothers. This study pilot-tested a comprehensive intervention with 15 homeless women and their 2- to 6-year-old children, recruited from a local family shelter. All participants were offered integrated intervention with three major components. The first component was housing which included 3 months of rental and utility assistance, and these services were not contingent upon women's abstinence from drugs or alcohol. The second and third components included 6 months of case management services and an evidence-based substance abuse treatment (Community Reinforcement Approach; CRA). Analysis revealed that women showed reductions in substance use ($F_{2,22} = 3.63; p < .05$), homelessness ($F_{2,24} = 25.31; p < .001$), and mental health problems ($F_{2,20} = 8.5; p < .01$). Further, women reported reduced internalizing ($F_{2,22} = 4.08; p < .05$) and externalizing problems ($F_{2,24} = 7.7; p = .01$) among their children. The findings suggest that the intervention is a promising approach to meet the multiple needs of this vulnerable population. These positive outcomes support the need for future research to replicate the findings with a larger sample using a randomized design.

Keywords

homeless mothers; substance abuse; intervention

On any given day, 800,000 people experience homelessness in the United States, including 200,000 children in families.¹ Several reports note that single mothers with young children are the fastest growing segment of the homeless population, and on average, children account for 41% of the homeless population with half of these children under the age of six years.² Homelessness among mothers and their young children is a significant problem that impacts not only the mother but also her children. Descriptive research in the prior fifteen years identifies reasons for mother's homelessness and associated struggles.³⁻⁵ Studies document significant substance use problems, domestic violence and mental health issues.⁶⁻⁸ Homeless children experience significant internalizing and externalizing problems, physical health problems, developmental delays and learning difficulties.⁹⁻¹¹ Despite the high rates of substance use, mental health and stability problems that homeless

mothers and their children face,¹² studies indicate that contact with child or adult mental health services is low (5% for children, 12% for mothers).¹³ Also, the literature is characterized by a dearth of studies focused on identifying effective intervention strategies for these women and children.¹⁴ This study seeks to address that gap.

Onken, Blaine, and Battjes¹⁵ proposed a stage model of behavioral therapies research noting three divisions in a rigorous scientific process that leads from initial clinical innovation through efficacy research to effectiveness research. The current study is a stage 1a study, in which an integrated intervention, comprised of several treatment components (housing, case management and substance abuse treatment) was tested using a nonrandomized design with a small number of women and over a period of six months. The goal of a stage 1a study is to provide preliminary evidence of the intervention's feasibility and potential for positive outcomes.¹⁶

Few prior studies have tested interventions for substance abusing women with young children in their care. In particular, two studies using a randomized design were found.^{17,18} Smith and colleagues¹⁸ examined substance use outcomes and housing stability among 149 homeless women with young children who were randomly assigned to a drug-free modified therapeutic community or to a non-residential condition. It was found that the residential condition for substance abusing homeless mothers showed low effectiveness, though homeless women were more successfully engaged in substance abuse treatment through the provision of housing. More recently, Sacks et al¹⁷ also evaluated a modified therapeutic community for drug addicted homeless mothers as compared to a traditional therapeutic community. Findings indicated that interventions that included specifically developed activities for homeless mothers such as parenting and communication skills training improved psychological functioning and health outcomes. However, no differences were found for parenting or housing stabilization between groups.

There are two studies using a non-randomized design.^{19,20} Stahler and colleagues¹⁹ compared outcomes of the addition of mentoring to an intensive (6 to 12 months) residential treatment center for substance abusing mothers with preschool children in their care. Findings indicated that substance use and related problem behaviors were significantly reduced among women who sought mentoring as well as among those who did not seek mentoring at 18 months post-intake. Another non-randomized intervention program, the Threshold's Mothers Project,²⁰ provided 'intensive case management' to homeless mothers, including housing, mental health and substance abuse counseling. The program had high retention rates of mothers (92% at 6 months and 79% at 12 months) and showed reductions in substance use and homelessness at 6 and 12 month follow ups. Each of the studies reviewed above examined outcomes from residential treatment programs. However, few substance abusing mothers with children in their care access residential programs, and when they do, drop-out rates are often high.²¹

While outcome data on substance abuse treatment for homeless women is starting to appear in the literature,¹⁷⁻²¹ more research is needed about effective treatments for homeless women. Within the last five years it was noted that "in contrast with single adult homeless people, there has been no systematic development of mental health services for homeless

mothers”²²(p158) and this was echoed in 2004, “although there is strong research evidence on homeless mothers’ multiple unmet needs, there is very limited knowledge of effective interventions and service models.”²³(p327) Homeless women report not seeking substance abuse treatment for fear that their children will be removed from their care. The threat of having a child removed, even if temporarily, is a significant barrier for those in need of substance abuse treatment.²¹

According to Zerger,²⁴(p28) traditional outpatient treatment “is insufficiently intensive to meet the needs of patients with moderate to severe substance abuse disorders nor does it address the multidimensional needs of homeless, alcohol or drug dependent patients.” Housing combined with intensive, supportive outpatient services may be necessary to successfully end homelessness and address associated problems. The provision of housing has been shown to improve retention in substance abuse treatment intervention programs and appears to improve other outcomes among individuals experiencing homelessness including substance use.^{25–28} In addition, Tischler et al.²² note that providers are faced with various service requests from homeless mothers and the need for case management is apparent. Counseling is often given lowest priority by clients due to the constant crises over tangible needs,²⁹ so the combination of case management and counseling was expected to enhance client outcomes in the current study.

The present study addressed the material and mental health needs of substance abusing homeless mothers by providing 3 months of independent housing and 6 months of case management and an empirically supported substance abuse treatment (the Community Reinforcement Approach, CRA³⁰). Each of these intervention components has shown promise with similar populations experiencing homelessness. Further, given that fragmentation of service provision is a significant barrier for homeless individuals to receive the care that they need, one response is to implement a fully integrated treatment model in which a unitary system of care is provided (eg, case management integrated with substance use/mental health treatment (CRA) offered by one counselor) rather than a model linking individuals to various care providers in a parallel fashion.²⁴

The integrative treatment employed was based upon a Housing First approach. The Housing First Model was developed by Pathways to Housing to provide immediate access to independent apartments and supportive services for the most vulnerable homeless people with severe mental illness and substance use disorders, without any prerequisites for sobriety or participation in psychiatric treatment.^{28,31} It is based on the beliefs that housing is a fundamental human right, recovery from mental illness is possible, and that consumers can make competent choices.³¹ Similarly, participation in treatment was not required for remaining in the housing offered in the current study. Three published randomized controlled trials of Housing First were identified. Tsemberis, Gulcur, and Nakae²⁸ and more recently, Padgett, Stanhope, Henwood, and Stefancic³² found that compared with participants in treatment as usual (the continuum of care), participants in the Housing First program were able to obtain and maintain independent housing without compromising psychiatric or substance abuse symptoms at 24 and 12-months follow-up, respectively. Sadowski, Kee, VanderWeele, and Buchanan³³ reported that compared with the usual care group, homeless adults with chronic medical illnesses in the Housing First group had almost

30% less time in hospitalizations and their emergency department visits decreased by 24% after 18 months. The CRA component of the intervention offers an empirically-based multifaceted approach to substance abuse treatment that also addresses many of the clinical needs of multi-problem homeless individuals.^{34–36} Although CRA is based upon an operant theoretical perspective, it also integrates and conceptually links behavioral and cognitive intervention strategies to a multi-causal formulation of problem behaviors. That is, cognitive behavioral techniques are utilized by CRA as the focus is on skills building (communication, problem solving, social and life skills) as well as reinforcing competing activities to drug and alcohol use. It has shown success with substance abusing homeless adults, including women.^{36,37}

Case management is considered essential among providers³⁸ given that they are faced with various service requests from those experiencing homelessness.^{22,23} Case managers advocate for their clients and attempt to connect them to social services. Controlled evaluations of case management for use with homeless, substance abusing individuals are sparse. However, one trial with homeless youth³⁹ and two with adults^{40,41} conclude that time limited case management (eg, 6 months) is as effective as intensive, unlimited case management. These studies also suggested that case management alone may be insufficient to address the range of needs, and that psychosocial treatment combined with case management, may have more potential. Therefore, CRA and case management were combined with a housing first-based model to comprehensively address the range of needs among these women.

In the current study, all homeless mothers received the integrated intervention and their outcomes were assessed up to 6 months. Specifically, substance abuse, housing, and mental health functioning were the primary dependent variables while employment, child internalizing and externalizing problems, and interpersonal stress (parenting stress and battering) were secondary outcomes. A main effect of time in which mothers and their children would show reductions in problem areas and improved functioning at 6 months post-baseline was expected.

METHODS

Participants

Homeless mothers ($n = 15$) were recruited through referrals from a local family shelter in a large Midwestern city. To be eligible for participation, mothers had to (1) meet the McKinney-Vento Act⁴² definition of homelessness as lacking a fixed, regular, and adequate nighttime residence, and be living in a publicly or privately operated shelter designed to provide temporary living accommodations, or a public or private place not designed for, or ordinarily used as, regular sleeping accommodations for human beings, (2) have physical custody of a biological child between the ages of 2 to 6 years, (3) and meet the Diagnostic Statistical Manual of Mental Disorders—Text Revision⁴³ criteria for Psychoactive Substance Use or Alcohol Disorder. Mothers were excluded from the study if there was evidence of unremitted psychosis or other condition which would impair their ability to understand and participate in the intervention or consent for research participation. Please refer to Table 1 for a summary of sample characteristics.

Procedure

The shelter staff identified potentially eligible mothers and contacted the project coordinator to schedule an initial assessment interview. The interviews were conducted at the shelter at a convenient time for the mothers. Once the informed consent for research and treatment was obtained, mothers were screened for eligibility using the CDIS-IV⁴⁴ sections on substance abuse/dependence and schizophrenia. Those meeting the eligibility criteria continued with the assessment battery; those not meeting eligibility criteria were compensated with a gift bag filled with food, toiletries, and toys for children and continued with the shelter's program.

The baseline assessment was comprehensive, covering a wide range of topics regarding demographics, homelessness experiences, substance use, mental health problems, interpersonal issues and parenting experiences. The assessment included urine screening, computerized clinical interview and self-report questionnaires. For the urine screens, research assistants (RAs) provided urine toxicology cups to the participants, accompanied them to the restroom, and ensured that the participants were alone in the room. The baseline assessment took approximately 3 hours to complete and the mothers were compensated with a \$40 gift card for their time. Following the baseline assessment, all women received 6-months of the integrated treatment intervention. As described below, the intervention included housing, case management and CRA³⁰ as its core components. All participants completed a follow-up interview at 3 and 6 months post-intake. Follow-up assessments were conducted by undergraduate or graduate RAs usually at the mother's home. The follow-up interviews took approximately 1.5 hours to complete and mothers received a \$40 gift card for their time. All research procedures were approved by the Institutional Review Board of the Ohio State University.

Therapists, Clinical Training, and Supervision—Three masters level, Ph.D. students in a couple and family therapy program provided the intervention. All therapists were female and White, non-Hispanic. Therapist experience ranged from 2 to 4 years. Therapist training consisted of readings including the procedure manual, and Meyers and Smith's³⁰ book on CRA. In addition, a two-day didactic training with role play exercises and ongoing weekly group supervision were provided by the first author. Supervision included reviewing audio-recorded case management and substance abuse treatment (CRA) sessions, providing feedback on therapist adherence to the research protocol, discussing of problems and case consultation. As this pilot study entailed the development and refinement of a housing-based comprehensive treatment procedure, supervision meetings also provided the context to gather information for improving and modifying the treatment manual.

Treatment—The intervention employed an integrative approach to address the multifaceted needs of the women and included housing, case management and substance abuse counseling (CRA) components as described below.

Housing: The therapist provided a list of available apartments to the mother, usually in the first meeting. The therapist emphasized that the independent housing was not contingent on substance abuse treatment and participation in the therapy and case management sessions

was completely voluntary. Mothers were told to select up to three apartments from the list and therapists contacted landlords to set up appointments in the same week. The mothers received three months of utility and rental assistance of up to \$600 per month. Furniture and appliances were also provided through donations. The project staff collaborated with local realtors and landlords who agreed to rent their units to homeless mothers, most of whom had eviction histories, poor credit, criminal records, and/or unpaid past utility bills. Mothers signed the lease with the landlords, agreeing that they were responsible for maintaining their apartments.

Case management: This component of the intervention aimed to address the basic needs of the mothers including issues with housing, safety, food, medical/dental care, employment, and child care. Case management started with an assessment of mother's needs and developing a specific service plan. The intervention included referring and transferring mothers to social services, continuous evaluation of client progress, and advocating on behalf of the mothers. Through case management, the mothers were referred to psychiatric evaluation, were assisted to obtain welfare benefits (cash assistance, food stamps, child care, social security benefits), and were transported for job applications/interviews. The overarching goal was to connect homeless mothers with the social services to meet their immediate needs. Case management occurred over a six month period, with a minimum frequency of one meeting per week. Therapists were available 24 hours for crises including weekends and holidays. Therapists met clients in the client's home or in alternative locations convenient for the client.

Substance abuse intervention: This component, utilizing CRA,³⁰ focused primarily on substance use and mental health issues. The core session topics included a functional analysis of using and non-using behaviors, refusal skills training, and relapse prevention as well as social skills training including communication and problem-solving skills, social and recreational counseling, anger/stress management and support with parenting. The treatment aimed to increase alternative reinforcing activities in the client's life which compete with substance abuse and other maladaptive behaviors. Therapists conducted at least weekly CRA sessions, usually in the client's home, for up to 6 months.

Measures

Sample Characterization—A *demographic questionnaire* was administered by the graduate RAs to assess socio-demographic characteristics of the mothers and their children. The variables included age, self-identified ethnicity, current marital status, income resources, homeless experiences, and mental health history of mothers as well as age, gender, and ethnicity of their children.

Diagnostic Status—The Computerized Diagnostic Interview Schedule⁴⁴ was administered as a screening tool to determine formal eligibility of the mothers at the baseline interview. CDIS is a structured comprehensive psychiatric interview containing 263 items based upon DSM-IV criteria, and includes modules to diagnose substance abuse and dependence and schizophrenia. Also, to assess potential co-occurring disorders, the sections

on schizophrenia, post traumatic stress disorder, and major depressive disorder were used in the current study.

Primary Outcome Measures

Housing: Because the project intervention included housing as well as rental and utility assistance for three months, maintenance of housing was one of the primary outcome variables. Information regarding housing stability came from several sources; all therapists maintained contact with their clients and provided information regarding their clients' current housing status in their case notes and supervision logs. In addition, RAs contacted the mothers for their three and six month follow up assessments, updated locator forms, and recorded the current address of the mothers. The housing status of all 15 mothers was obtained using these strategies.

Substance use: The self-reported substance use was measured via the Form 90 drug and alcohol interview. The Form 90⁴⁵ is a semi-structured instrument which combines the timeline follow-back method and grid averaging. Following the standard scoring manual⁴⁵ the current study utilized the calendar data information to provide scores for the percent days of substance use in the last 90 days. The Form 90⁴⁵ was administered at both baseline and follow-up assessments to measure potential change in frequency of alcohol and drug use. Similar to prior studies on substance abuse treatment,^{eg,46} RAs also collected urine toxicology screens from the mothers at baseline and follow-up interviews to validate self-reported drug use. The urinalysis procedure employed the BMC ToxCup[®] Test Kit to test for cannabinoids, amphetamines, methamphetamines, phencyclidine, cocaine/crack, and opiates. This drug screening procedure has shown high specificity and sensitivity to the drugs tested, converging with the findings from self-reported drug use.⁴⁷

Mental health: The Short-Form-36v2 (SF-36v2) was utilized as a general assessment of health status of the homeless mothers. The SF-36v2^{48,49} is a multi-purpose, short-form health survey and includes 36 questions assessing physical, social and daily functioning. The current study utilized the SF-36v2 mental health composite score as an overall indicator of mental well-being. Higher scores indicated better mental functioning and the internal consistency of the measure in the current sample was .79, .83, and .85 for baseline, 3-month, and 6-month follow up, respectively.

The Beck Depression Inventory-II (BDI-II⁵⁰) was administered to the homeless mothers to assess their depressive symptoms. The BDI-II is comprised of 21 items rated on a 4-point Likert scale and the items correlate with the DSM-IV-TR⁴³ criteria for depression. In the current study, reliability of the scale was .92 at baseline and was .85 and .95 for 3-and 6-month follow-up assessments.

Secondary Outcome Measures

Employment: Mother's employment status was assessed via several sources. Information primarily relied on therapist logs and case notes. In addition, the demographic questionnaire at the baseline and follow up interview tapped into income resources and current

employment status of the homeless mothers and the Form 90 queried the number of employment days in the prior 90 days.

Child behavioral problems: The Child Behavior Checklist/1½–5 (CBCL/1½–5)⁵¹ was administered to the mothers as a measure of child problem behaviors. The measure includes 120 items rated on a 3-point Likert scale, with higher scores indicating more problem behaviors. The present study utilized internalizing and externalizing grand scales of the CBCL/1½–5 at the baseline and follow-up interviews. The internal consistency of the externalizing subscale was .88 at baseline, .93 at 3 months, and .86 at the 6 month post-baseline assessment. For the internalizing subscale, the reliability was .78, .86, and .78 for each assessment point, respectively.

Parenting stress: The Parenting Stress Index Short Form (PSI/SF)⁵² was administered to the homeless mothers to assess their stress associated with parenting their children. The PSI/SF includes 36 items rated from 1 (strongly disagree) to 5 (strongly agree) with higher scores indicating higher levels of parenting stress. The present study utilized the total score of parenting stress as reported by homeless mothers at the baseline and follow-up interviews. In this sample, the alpha coefficient of the scale was .91 at baseline, .92 at the 3-month follow up, and .88 at the 6-month follow up.

Intimate partner violence: Homeless mothers were also asked to report violence experiences with their most recent intimate partner as assessed by the Women's Experience with Battering Scale (WEB).^{53,54} The WEB's 10 items are rated on a 6-point Likert scale with response categories ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Higher scores on the scale imply greater exposure to abuse and violence. Women who score higher than 20 on the WEB for any given partner are considered to have experienced intimate partner violence.⁵³ The current study utilized both continuous (total WEB score) and dichotomous measures (abused vs. not abused) of the WEB scale. The internal consistency of the scale was .94 at baseline, .85 at 3 months, and .92 at 6 months in the current sample.

Statistical Analysis

The initial analysis examined the descriptive characteristics (ie, frequencies, means, standard deviations, skewness, and kurtosis) of the variables of interest. Two variables (percent days of substance use and percent work days as reported in the Form 90) were identified as having problems with both kurtosis and skewness, violating the assumption of normality.⁵⁵ These variables were log-transformed before the statistical analysis. Variables which had highly skewed distributions, but did not indicate problems with kurtosis were not transformed because ANOVA is vastly more affected by the kurtosis of the error distribution rather than by its skewness, and is robust to skewness.⁵⁵

Next, a series of one way repeated-measures ANOVAs were run in which time was treated as the within subject factor with three levels (baseline, 3 month and 6 month follow up). Significant treatment effects over time were explored further by conducting pair-wise comparisons. The main goal of the analysis was to estimate change in primary and secondary outcomes over time. Considering the pilot nature of the study, the findings that

were marginally nonsignificant at $p = .05$ level were also reported. Despite the small sample size, ANOVA was preferred over using nonparametric tests for several reasons. First, this study pilot tested the integrated intervention in a small sample of homeless mothers and findings are informative in nature to guide future randomized controlled studies testing its efficacy. ANOVA is a relatively conservative test compared to nonparametric tests.⁵⁶ In addition, it enabled the researchers to evaluate clinical meaningfulness and significance of the findings by calculating effect sizes and power.⁵⁶ Effect sizes in this study can be utilized to calculate required sample size for adequate power in future studies. Therefore, ANOVA as a powerful parametric test was used for the current study.

Cohen's d as an indicator of effect size was calculated for each outcome variable regarding the change from baseline to the 6 month post-baseline assessment. Cohen's d is a descriptive measure showing the difference between the means divided by standard deviation of either group. Cohen⁵⁶ defined an absolute value of .20 as a small effect, .50 as a moderate effect, and .80 as a large effect size. Similar to previous pilot studies on substance abuse treatment, a moderate to large effect size was considered a clinically meaningful effect in the current study. Furthermore, post-hoc power analysis was conducted to represent the clinical significance of the intervention. G*Power2, an online general power analysis program was utilized for the post-hoc power analysis. The SPSS version 17⁵⁷ was used for the rest of the data analysis.

RESULTS

Treatment Services: Ecologically Based Therapy and Its Components

Therapists conducted an average of 33.1 (SD = 7.6) sessions per participant and had an average of 49.7 (SD = 13.6) contact hours with each homeless mother. Specifically, mothers were provided 33.8 (SD = 12.5) contact hours of case management and 15.9 (SD = 3.9) contact hours of CRA over 6 months. It is important to note that case management contact hours revealed a relatively high standard deviation, compared to CRA contact hours, suggesting high variability among participants in their utilization of case management services. This is consistent with the client-centered treatment rationale of the study where case management was tailored for each individual client to meet her specific needs.

Figure 1 presents the breakdown of contact hours with the mothers for each month, showing the means and standard errors of the mean for CRA and CM sessions. During the first month of the treatment, the case management sessions were relatively more frequent than the CRA sessions, but they started to decline at the second month of treatment. This finding was expected given the treatment protocol and integrative approach of the study. That is, once basic needs were met and mothers were stabilized in the initial phase of the treatment, the CRA component of the intervention was delivered more frequently, coupled with case management sessions as needed.

Attrition

All women maintained contact with the RAs or their therapist during the 6 month project period. However, two women refused to complete follow-up assessment interviews. One did

not complete either the 3 or 6 month assessment, did not maintain her housing at 6 months, and was staying with her mother at the end of the project. Another client completed her 3-month post-baseline assessment, but did not complete her 6-month assessment. She moved in with a romantic partner at 2 months post-baseline and did not maintain her housing. Anecdotally, both women had relatively low contact hours with their therapist compared to their counterparts. Taken together, follow-up rates were 93.3% (14/15) and 86.6% (13/15) for the 3- and 6-month post-baseline assessments, respectively.

Primary Outcomes

Housing—Therapist case notes as well as supervision notes and anecdotal experience were used to document the success rates of the housing intervention. Of the 15 women housed at intake, only one woman left the housing provided by the project within the first 3 months and moved in with her romantic partner in another city. All other clients (14/15) remained in their housing, indicating a 94% success rate at 3 months. Four additional women did not remain in their apartments 3 months after rental assistance ended. Two of those women left to cohabitate with their romantic partners. One woman had custody issues and was mandated to seek residential treatment for substance abuse in order to have her children returned and therefore, left her housing. Another one had her utilities shut off and moved out of her apartment to stay with her mother. In sum, the housing intervention had a 66% (10/15) success rate at 6 months and even though these 5 women were not residing independently, all were stably housed.

Consequently, percent days homeless in the prior 90 days showed a highly significant decline over time among the mothers ($F_{2,24} = 25.31; p = .000$), with a high effect size ($d = 2.41$) and power (.99). A follow up trend analysis suggested a significant linear ($F_{1,12} = 31.73; p = .000$) and quadratic trend ($F_{1,12} = 10.97; p = .006$) of housing stability among the mothers over time. Considering that the percent of homeless days were decreasing over time (Table 2), the decreasing linear trend with high partial eta squared (.73) and power (.99) was accepted over the quadratic trend.

Substance Use—Given that substance use was the primary outcome variable of the study, careful consideration was given to ensure the validity of self-reported data. To that aim, correspondence between Form 90 calendar data and urine screening was examined. In the current sample, self-reported substance use showed high overall agreement with urine toxicology analyses (93.3% agreement). Only one participant denied using substances in the last 3 months, but had positive urine screen results. Since her urine screen did not match self-reported use, her self-reported data were considered invalidated and were not used in the analysis.

The one-way repeated measures ANOVA revealed a significant main effect of time on percent days of substance use in the prior 90 days ($F_{2,22} = 3.63; p = .043; d = .44$; power = .60). Specifically, mothers had reduced the percent days of substance use at the 3 month assessment ($M = 18.9\%$), compared to baseline ($M = 48.8\%$; $p = .013$). Substance use started to increase at the 6 month follow up ($M = 33.7\%$), but did not reach significance ($p > .05$).

Despite these significant findings, it is important to note that percent days of substance use was highly kurtoid at the 3 month follow up (Statistic = 8.31; SE = 1.19), violating the assumption of normality. Box plots were analyzed to examine potential outliers; there was one participants in the data who reported substance use every day in the past 3 months and two participants reported abstinence (no use). The sample size was too small to eliminate outliers, therefore log-transformation was preferred. The analysis was re-run with the log-transformed variable and results suggested no main effect for substance use over time ($F_{2,22} = 3.05; p = .068$).

Mental Health—Mothers' mental well-being, as assessed by their SF-36v2 Mental Health composite scores, significantly improved over time ($F_{2,20} = 8.5; p = .002; d = 1.08$; power = .99). It was found that mothers had better mental health at 3 months ($M = 43.8$) and 6 months ($M = 45.5$), than at baseline ($M = 36.6$). Trend analysis on SF-36v2 scores revealed a significant linear trend towards improved mental well-being among the mothers ($F_{1,10} = 12.05; p = .006$) with high observed power (.88). The analysis revealed no significant quadratic or cubic trends over time ($p > .05$). Similarly, mothers reported having fewer depressive symptoms at 3 months ($M = 22.9$) than at baseline ($M = 24.6$), and their symptoms continued to decrease at 6 month follow up ($M = 17.9$). Although reductions in BDI-II scores did not reach statistical significance ($F_{2,22} = 2.85; p = .08$), the effect size ($d = .59$) was moderate and power (.82) was high, indicating promising findings on the mental health outcomes (Table 2).

Secondary Outcomes

Employment—At baseline, only three women (20%) reported having a full or part time job in the past 3 months. Two additional women had jobs at the 3 month follow up, yielding 35.7% of the sample being employed, but only two of these women (15.4%) were able to maintain their jobs at the 6 month follow up. Employment outcomes were explored further by examining the percent of work days in the last 3 months. Given the high kurtosis of the percent days of work, this variable was log-transformed before the analysis. No significant main effect was found in mothers' employment days over time ($F_{2,24} = .18; p > .05; d = .09$; power = .05).

Given that 10 women (66%) maintained their apartment after rental assistance ended, it appears that women received income from other, non-employment sources. Among those who paid their rent, only two women (13.3%) were employed and had income from their jobs. Others received multiple sources of income including cash assistance ($n = 4$), food stamps ($n = 1$), child support ($n = 1$), student loan ($n = 1$), a job training grant ($n = 1$), and rental assistance from a community agency ($n = 1$). Some mothers received financial assistance from their families ($n = 4$) while others had family members move in with them ($n = 2$). Those mothers shared the rent with their family members.

Child Behavioral Problems—Analysis revealed a significant main effect of time on behavioral problems among children. Mothers reported that their children exhibited significantly fewer internalizing ($F_{2,22} = 4.08; p = .03; d = .97$; power = .74) and externalizing behaviors ($F_{2,24} = 7.7; p = .003; d = 1.37$; power = .95) at the end of treatment.

Tests of within-subjects contrasts showed a significant decreasing linear trend in child internalizing ($F_{1,11} = 7.12; p = .022$) and externalizing behaviors ($F_{1,12} = 14.31; p = .003$) at the 3- and 6-month assessment than at baseline. However, the quadratic and cubic trends were not significant in the trend analysis ($p > .05$).

Interpersonal Stress: Parenting Stress and Intimate Partner Violence—

Considering that the mothers may be underreporting their parenting stress due to social desirability factors, scores on the PSI-SF defensive responding scale were examined before running the analysis. In the current sample, only one mother reported extremely low scores, indicating that the majority of the sample was not responding defensively. This mother's responses were eliminated from the data. The analysis suggested that there was no change in parenting stress over time ($F_{2,20} = 1.0; p > .05; d = .07; \text{power} = .05$).

At baseline, the average baseline WEB score was 24 ($SD = 13.7$; range 10–47). There were reductions in WEB reported battering experiences but the change was nonsignificant ($F_{2,24} = .49; p > .05; d = .39$). For the average WEB score, the effect size was moderate ($d = 0.39$) with low power (0.15). Specifically, battering decreased from $M = 24.0$ at baseline to $M = 19.0$ at the 3-month follow up, which was maintained at the 6-month follow up, $M = 19.2$. These findings suggest that the intervention has the potential to reduce battering experiences among women but the power was too low to detect differences due to the sample size. Descriptive statistics revealed a decreasing frequency of battering among the mothers. At baseline, eight mothers (53.3%) reported having experienced intimate partner violence in their most recent relationships. However, five mothers (35.7%) at the 3 month post-baseline assessment and four mothers (30.8%) at the 6 month assessment reported recent abuse by an intimate partner.

COMMENT

To our knowledge, this is the first comprehensive intervention designed to address the multiple and varied needs of homeless women and children (housing, substance use and mental health). The data from this small, non-randomized pilot indicate that the intervention may hold promise for improving housing outcomes and reducing substance use and mental health problems among homeless women and behavioral symptoms among their young children.

Primary Outcomes

Housing—One woman left the project supported housing within the first 3 months (14/15 remained) indicating a 93.3% success rate at 3 months. While no other studies tracking supportive independent living among homeless women and children were identified, one study reported that 50% of substance abusing women with children in their care left a residential drug-free therapeutic community within 3 months.¹⁸ The current study also found that four additional women did not remain in their apartments 3 months after rental assistance ended, indicating that two-thirds of the women (10/15) successfully maintained their own apartments independently at six months. Kertesz et al.⁵⁸ found that 30% (11/37) of cocaine-abusing homeless women (without children in their care) in their sample reported stable housing (which included living with family members) 6 months after project

supported and administered housing ended. This study's findings suggest that independent living in apartments chosen by the women using a Housing First approach appears to be acceptable and feasible. Independent housing through a Housing First approach may be a promising alternative to long-term therapeutic communities as the literature notes that few women with children will attend these programs,²⁴ and independent housing is the preferred housing method among consumers.⁵⁹

Substance Use—Substance use showed a decline from baseline to 3 months and this decline was maintained at 6 months with moderate power (.60). However, when the kurtosis was controlled in the analysis, the reduction in substance use was not statistically significant ($p = .068$). Given the small sample size, the clinical significance of this finding should be considered with caution. Nevertheless, this finding is encouraging, considering the pilot nature of the study. The clinical approach to only address substance use when and if the client is ready and when other basic needs of immediate importance to the client have been addressed may be an important engagement strategy. That is, disempowered homeless populations have shown extremely high drop-out rates from substance abuse treatment programs. Substance abuse treatment drop-out rates range from 58%–90% among homeless, adult substance abusers^{19,26,60,61} with one study indicating an 85% drop-out rate among homeless women.¹⁸ In sum, while substance use was not eliminated, the reductions in frequency of use are encouraging. Many consider substance use a chronic condition with high potential for relapse.⁶¹ One response is to implement a substance use intervention over a longer period of time, beyond 6 months, so that treatment gains are maintained, and women continue to have support during the transition out of homelessness.

Mental Health—A statistically significant improvement from baseline to 6-months in the SF-36v2 mental health composite was found with a high effect size and high power. Furthermore, reductions in BDI-II depressive symptoms were observed. This is a promising finding of potential clinical importance, although it did not reach statistical significance ($p = .08$) given the small sample size. Studies indicate higher levels of depressive and mental health symptoms among those experiencing homelessness.^{62,63} This association might be related to stressful life events, less control of life events, and few social and economic resources to meet the demands of these stressors.⁶⁴ CRA addresses mental health symptoms through increasing coping strategies and skills for handling negative emotional experiences. Also, inasmuch as housing reduces distress and increases the perception of control over life events, as well as increases access to health and social services, depressive symptoms, and mental health problems may have been ameliorated. However, future research comparing this study's intervention to a control group using a larger sample size is needed in order to rule out time and attention effects and to assess the differential impact of the intervention on the observed changes.

Secondary Outcomes

Employment—Employment days did not significantly increase from baseline to 6 months and only 13% (2/15) of the women reported stable employment (continuous work for the prior 3 months) at 6 months. Similarly, Kertesz et al.⁵⁸ reported that at 12-months post-baseline, 13% of the women experiencing homelessness were stably employed after

receiving 6 months of intensive day treatment, including intensive work therapy and placement, and another 6 months of weekly individual and group therapy. Our findings are comparable, although our intervention and housing program was less intensive, suggesting that the type and intensity of intervention for increasing employment among homeless women is still an important question.

Two-thirds of the women paid their rent for 3 months after project assistance ended although most used non-employment sources of income, such as cash assistance, student loans, job training grants, and assistance from family members. While employment is an important option for maintaining housing, women that struggle with substance use, mental health and child care might need more time to stabilize these issues prior to obtaining employment. Cash assistance, other sources of public support (eg, food stamps), and/or support from other family members may be viable options for bridging the period of homelessness and independence. It is possible that a longer period of rental support (6 months rather than 3 months) is needed.

Parenting Stress and Child Internalizing and Externalizing—Interestingly, the intervention had no impact on alleviating parenting stress among the mothers, but had a large effect on reducing externalizing and internalizing behaviors of homeless children. CRA included parenting skills training and strategies to discipline and monitor children. Possibly, this component of CRA was influential in reducing child problem behaviors through promoting effective parenting. In addition, homelessness itself is associated with significant stress among children including unpredictability and anxiety associated with not being in one's own surroundings.⁹ The housing intervention may also have provided structure and feelings of safety for these children, which may alleviate their behavioral and emotional symptoms.

Overall, the observed improvement in child behaviors suggests that the intervention has the potential to benefit other family members beyond the mother alone and could have significant implications for prevention. Also, future research should explore the extent to which children enhance or perhaps weaken maternal efforts and success with sobriety and independence (employment, self-sufficiency), and under which conditions (eg, individual and interpersonal).

Intimate Partner Violence—Women reported decreased exposure to intimate partner violence on the WEB scale at 3 and 6 months, but the change in the average WEB score across all women was not statistically significant. The effect size was moderate and power was low due to the small sample size. A fully powered study may better identify significant effects. While eight women reported recent battering experiences at baseline this decreased to four women at the 6-month assessment. Studies indicate that at least 50% of homeless women report fleeing domestic violence situations.^{7,65} Providing independent housing may be an option for reducing future violence as women may be less likely to return to unsafe situations in order to meet immediate needs for themselves and their children. The data suggest that while intimate partner violence was reduced, some women are still at risk for future intimate partner violence even once they are independently housed. Therefore, therapeutic efforts will need to focus on preventing future victimization experiences which

might underscore the importance of financial security/independence. Also, the decrease in the number of women reporting intimate partner violence in our study could be a function of decreased substance use and/or improved mental health status. Researchers have noted a relationship between intimate partner violence, substance abuse and mental health functioning.^{eg,66}

LIMITATIONS

The goal of this study was to provide preliminary outcomes of the housing first-based approach combined with case management and CRA. There are several limitations of this study which should be considered when interpreting the findings. A longer follow-up is needed to assess the stability of positive outcomes. Also, the study utilized a nonrandomized design and lacked a control group. Therefore, the effect sizes and clinical significance of the findings might be inflated. As this was a pilot study, Bonferroni adjustment for multiple tests was not conducted. However, if the alphas were adjusted for the ANOVAs, several outcome variables (substance use and BDI-II depressive symptoms) would no longer be statistically significant at $p < .05$. Yet, even with a small sample size, the study revealed high statistical power, and several findings were clinically significant (housing, SF-36v2 mental health composite, children's internalizing and externalizing problems) and some findings were promising (substance use, depressive symptoms), suggesting that these may be robust findings within a fully powered trial. In addition, the lack of randomization limits conclusions regarding the cause of these improvements, as time, attention, or variables other than the treatment intervention may have contributed to the observed outcomes. Future study will need to compare the intervention utilized in this study to treatment as usual provided within the community. This design will offer important information regarding the intervention's differential efficacy or ability to improve upon services offered within the community.

CONCLUSION

The literature suggests that those experiencing homelessness place a higher priority on the basic needs of food, shelter, and security than on issues of mental health.²⁴ One implication of this finding is that service providers need to first address subsistence needs such as housing before addressing the substance abuse or mental health issues. This approach is contrary to the "continuum of care" which is the predominant approach to housing homeless people with mental illnesses in the United States.³¹ The continuum of care approach is different from Housing First in that it assumes that individuals with severe psychiatric disabilities cannot maintain independent housing before their clinical status is stabilized.³¹ In addition, enrollment in permanent supportive housing programs through the continuum of care is contingent upon abstinence from alcohol and drugs and participation in mental health treatment.⁶⁷ This study showed that mental health symptoms, substance use and children's internalizing and externalizing problems improved even though housing of the woman's choosing was provided immediately and was not abstinence contingent, or contingent on treatment attendance. Furthermore, two-thirds of women were able to maintain and pay the rent for their own apartments for 3 months following 3 months of rental assistance, which compares favorably to other reports utilizing abstinent contingent, temporary housing⁵⁸ and

a therapeutic community.¹⁸ Additional research and clinical attention is needed in order to identify how best to intervene to improve stable employment and eliminate intimate partner violence.

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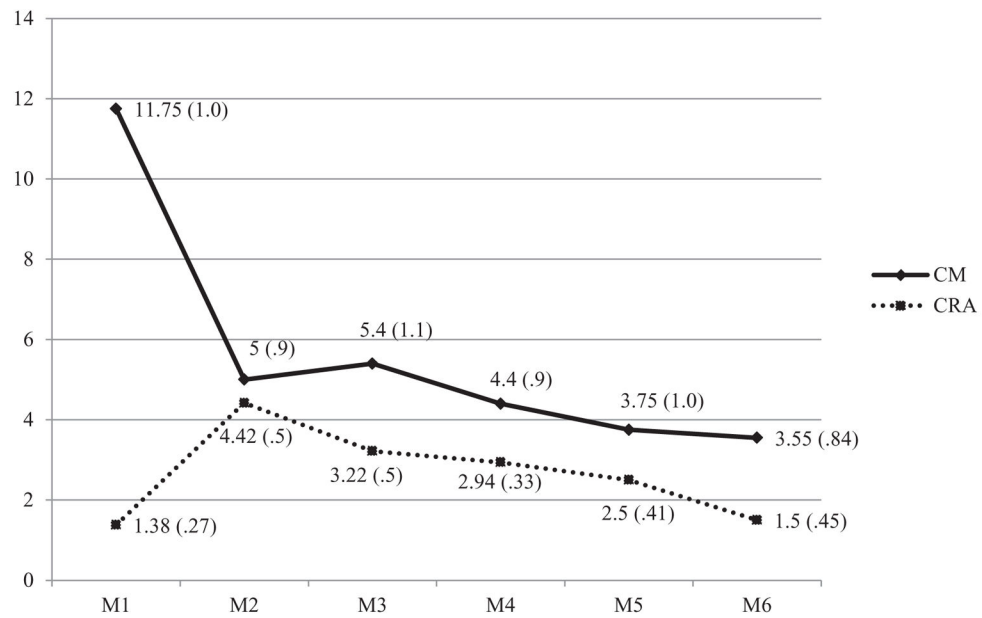


FIGURE 1. Contact hours with the homeless mothers over 6 months of treatment period. Notes. M1 = First month; M2 = Second month; M3 = Third month; M4 = Fourth month; M5 = Fifth month; M6 = Sixth month of treatment. CM = Case management; CRA = Community Reinforcement Approach. Means and standard errors of the mean (in parentheses) are shown for each time point.

TABLE 1

Characteristics of the Sample at Baseline ($n = 15$)

Variables	<i>n</i> (%)	Mean (SD)	Range
Demographic characteristics			
Age		25.2 (6.1)	19–39
Ethnicity			
African/African American	10 (66.7%)		
White, non-Hispanic	3 (20%)		
Mixed/Other	2 (13.3%)		
Current marital status			
Single, never been married	14 (93.3%)		
Divorced	1 (6.7%)		
Highest level of education in years		11.27 (1.5)	8–13
Employment status			
Work 40+ hours	2 (13.3%)		
Work fewer than 40 hours	1 (6.7%)		
Unemployed	12 (80%)		
Personal monthly income		\$517.3 (\$395.7)	\$0–\$1,280
0	3 (20%)		
\$1–\$500	5 (33.3%)		
\$500–\$1000	4 (26.7%)		
More than \$1000	3 (20%)		
Ever been arrested	8 (53.3%)		
Homelessness experiences			
Age homeless for the first time		20.4 (5.32)	13–34
% days homeless in the past 3 months		75.47 (34.9)	6.67–100
Children			
Average number of children		2.4 (.83)	1–4
Currently expecting a baby	5 (33.3%)		
Average age of children		3.7 (4.2)	Newborn–18
Gender			
Female	17 (47.2%)		
Male	19 (52.8%)		
Substance use			
% days substance use in the past 3 months		48.8 (31.6)	
Breakdown of substance use per drug			
Alcohol use	9 (60%)	12.2 (6.9)	3.3–21.4
Average SECs among alcohol users ^a	9 (60%)	6.6 (9.9)	0.8–24
Marijuana use	11 (73.3%)	46.5 (35.1)	2.2–100
Cocaine use	3 (20%)	32.2 (32.2)	3.3–68.9
Opiate use	2 (13.3%)	42.3 (58.3)	1.1–83.5
Mental health			

Variables	<i>n</i> (%)	Mean (SD)	Range
Co-occurring disorders ^b			
Major Depressive Disorder	3 (20%)		
PTSD	1 (6.6%)		
Both Major Depressive Disorder and PTSD	5 (33%)		
Suicide attempt	6 (40%)		

^aSEC refers to the Standard Ethanol Content as an indicator of quantity of alcohol use (Miller, 1996). One SEC equals 0.5 oz (15 ml) of absolute ethanol.

^bAll participants had to meet the diagnostic criteria for substance abuse or dependence to be eligible for the study. Therefore, Axis I disorders in the table illustrate co-occurring disorders among the mothers.

TABLE 2

Primary and Secondary Outcomes

	Assessment point			Test statistic	Cohen's <i>d</i>	Power
	Baseline	3 month post-baseline	6 month post-baseline			
Primary outcomes						
<i>Housing</i>						
Women residing in their own apartments	f (%)	14 (93.3%)	10 (66%)	N/A		
% days homeless in the past 3 months ^a	M (SD)	75.5 (34.9)	20.9 (16.6)	F _{2,24} = 25.31; <i>p</i> = .000	2.41	.99
<i>Substance use</i>						
% days substance use in the past 3 months ^b	M (SD)	48.8 (31.6)	18.9 (26.5)	F _{2,22} = 3.63; <i>p</i> = .043	.44	.60
<i>Mental health</i>						
SF Mental Health Composite Score	M (SD)	36.6 (5.3)	43.8 (8.2)	F _{2,20} = 8.5; <i>p</i> = .002	1.08	.99
BDI Depressive symptoms	M (SD)	24.6 (11.2)	22.9 (7.3)	F _{2,22} = 2.85; <i>p</i> = .08	.59	.82
Secondary outcomes						
<i>Employment</i>						
Women working full-time/part time in the past 3 months	f (%)	3 (20%)	5 (35.7%)	N/A		
% Work days in the past 3 months ^c	M (SD)	10.5 (22.9)	6.1 (11.5)	F _{2,24} = .18; <i>p</i> > .05	.09	.05
<i>Child behavioral problems</i>						
CBCL Internalizing behaviors	M (SD)	10.8 (5.4)	9.5 (5.8)	F _{2,22} = 4.08; <i>p</i> = .03	.97	.74
CBCL Externalizing behaviors	M (SD)	18.8 (7.9)	13.2 (7.8)	F _{2,24} = 7.7; <i>p</i> = .003	1.37	.95
<i>Interpersonal stress</i>						
PSI Parenting stress total score	M (SD)	90.8 (18.5)	92.4 (18.7)	F _{2,20} = 1.0; <i>p</i> > .05	.07	.05
WEB Total battering total score	M (SD)	24.0 (13.7)	19.0 (9.9)	F _{2,24} = .49; <i>p</i> > .05	.39	.15
Women experiencing battering	f (%)	8 (53.3%)	5 (35.7%)	N/A		

^aThis variable refers to percent days without adequate shelter, couch surfing, or temporary homeless status.

^bSubstance use had high skewness and kurtosis at the 3 month follow up. For clarity, the table presents the ANOVA results with the non-transformed substance use variable.

^cPercent work days was log-transformed before analysis.