

Effectiveness of Dialectical Behavioral Therapy on Reduction of Recidivism among Recently
Incarcerated Homeless Women: A Pilot Study

RUNNING HEAD: Impact of DBT Program on Recidivism among Homeless

Female Ex-Offenders

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ABSTRACT

The purpose of this pilot randomized controlled trial (RCT) was to compare the six month outcomes of a Dialectical Behavioral Therapy – Corrections Modified (DBT-CM) program versus a Health Promotion (HP) program on mitigating recidivism among 130 female parolees/probationers between baseline and six month follow up. The effect of DBT-CM on reducing recidivism was greater among those who expressed a desire for help (RR = 0.40; 95% CI = 0.16 - 1.00; P = 0.050) and among HFOs that were younger (< 50 years of age; RR = 0.46; 95% CI = 0.19 - 1.11; P = 0.085) and participants with Desire for Help score > 35 (Model 3; RR = 0.40; 95% CI = 0.16 - 1.00; P = 0.050). Findings from this pilot study suggest that the DBT-CM intervention may be effective in reducing reincarceration rates among some HFOs during reentry. Larger RCTs are needed to validate our findings.

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Effectiveness of Dialectical Behavioral Therapy on Reduction of Recidivism among Recently Incarcerated Homeless Women: A Pilot Study

Recent public attention to rising recidivism rates in California, a state which experiences more than 45% of offenders returning to prison within the first year of release and more than 60% return within three years (California Department of Corrections and Rehabilitation, 2014) serves as an impetus for this current study. Correctional staff, policy-makers, and health providers in community rehabilitation programs have the opportunity to make a difference in the lives of the offenders and for the communities to which they return. With increasing attention to reentry challenges of homeless female ex-offenders (HFOs) in particular, health and social conditions of this subgroup are being closely examined, along with an assessment of the impact of treatment programs on improvement of health outcomes, social conditions and most importantly, recidivism rates.

Among the HFO population, challenges to successful re-entry into society include underlying mental health issues, women's physical health issues, substance use, low literacy, unemployment and unstable housing conditions (Binswanger et al., 2011; Kulkarni, Baldwin, Lightstone, Gelberg, & Diamant, 2010; Staton, Leukefeld, & Webster, 2003). To resolve these issues, specialized community-based, integrated, evidence-based treatment is needed to successfully reintegrate back into their communities (Chandler, Peters, Field, & Juliano-Bult, 2004).

Factors Impacting Recidivism

According to the Bureau of Justice Statistics, there are approximately 6.7 million adults in jail and prison as well as those who are on probation or parole in the United States (Kaeble, Glaze, Tsoutis, & Minton, 2016). Specifically, 18% of the correctional population consists of

women (more than 1.2 million), where 30% are in jail or prison and 70% are under probation or parole (Kaeble et al., 2016). Women in the correctional system face multiple risks that increase their vulnerability to recidivate upon release. Internal and external risks include health issues, communicable diseases, substance abuse disorders, and mental health issues (Colbert, Sekula, Zoucha, & Cohen, 2013; Davis & Pacchiana, 2004). Further, unique circumstances such as survival from abuse, poverty, substance abuse, and lack of resources can increase anxiety, depression and post-traumatic stress disorder (PTSD) (Blasiolo, Shinkunas, Labrecque, Arnold, & Zickmund, 2006; Coolidge, Marle, Van Horn, & Segal, 2011; Freudenberg, Daniels, Crum, Perkins, & Richie, 2005) invariably complicate the transition back into the community.

While there are rehabilitation programs that address these reentry challenges, often the homeless offender population drop out of these community-based treatment programs at a rate of two-thirds or more (Zerger, 2002). Further, female ex-offenders have higher recidivism rates due to drug-related violations in comparison to male offenders (32% vs 21%) (Leukefeld et al., 2009). It has been recognized that the failure to complete the treatment programs among women may be related to unresolved psychological concerns or attempts to cope with past trauma (Nyamathi et al., 2008).

Research has shown that if women offenders receive adequate reentry support that addresses health care and multiple other issues, recidivism rates can be reduced (Freudenberg et al., 2005). Therefore, it is critical for HFOs to engage in a community-based comprehensive rehabilitation programs with behavioral interventions that not only address reentry health and social issues but also equip them with positive coping and communication skills that will help them transition back into society.

Behavioral Intervention Programs

Behavioral intervention programs based in community-based rehabilitation programs can benefit the health of the recently incarcerated as well as disrupt existing recidivism rates. Historically, treatment programs for the offender population who experience co-occurring disorders have been limited by the traditional mental health or substance abuse approaches; however, they fail to utilize trained staff that can provide integrated care for offenders with co-occurring disorders (Farabee et al., 2001).

Dialectical behavioral Therapy (DBT) is a behavioral intervention that is being used in some rehabilitation programs. Originally, the DBT intervention was developed by psychologist Dr. Marsha Linehan to treat chronically suicidal individuals (Linehan, Armstrong, Suarez, Allmon, & Heard, 1991), but was then modified to decrease dropout of treatments and risky behaviors among suicidal patients with borderline personality disorders through comprehensive cognitive behavioral techniques (Linehan et al., 1991; Linehan et al., 2006). DBT was further modified for the incarcerated population where the DBT corrections-modified (DBT-CM) intervention, referred to in this paper as DBT, has been used to significantly improve the physical aggression, distancing coping methods, and behaviors of difficult, impulsive, and/or aggressive male adolescent offenders (Shelton, Kesten, Zhang, & Trestman, 2011).

Four core modules of DBT include mindfulness, interpersonal effectiveness, distress tolerance, and emotion regulation, helps ex-offenders change their problematic thoughts, emotions, and behaviors influenced by past trauma or stressors, as well as learn adaptive and cognitive skills to prevent the reoccurrence or escalation of those maladaptive thoughts and behaviors (Shelton et al., 2011).

In the female offender population, where there are links between emotional dysregulation, behavioral control, substance use disorders, and violent behavior (Trupin, Stewart, Beach, & Boesky, 2002). DBT involving a combination of skills training, problem solving, and validation techniques can reduce self-destructive, impulsive, and aggressive behaviors (Trupin et al., 2002). In a pilot program conducted in three British prisons for women offenders diagnosed with borderline personality disorder (BPD), findings revealed significant improvement in areas linked to criminogenic risk (i.e., impulsivity, anger, locus of control, self-esteem and emotion regulation), and in the characteristics of the global BPD syndrome when compared to the control group (Nee & Farman, 2005). Since previous implementations of DBT resulted in changes of institutional behavior in the female offender population with co-occurring disorders, there is validity in its targeted use on homeless female offenders with varying types of parasuicidal and violent behavior.

In this study, DBT was used to stabilize homeless female ex-offenders by helping them manage their emotional variations and offense-related behaviors to achieve control through mindfulness and structured cognitive-behavioral techniques. This treatment translates into helping offenders balance ‘who they are’ with ‘who they need to be’ by accepting their past or current situation while progressing towards change. Through DBT, homeless persons with recent history of incarceration can be emotionally stabilized and taught the necessary behavioral skills for controlling of self-destructive behavior, reconstructing maladaptive cognitions, increasing patient compliance, and attaining long-term improvements that will ultimately enhance their quality of life (Berzins & Trestman, 2004; Linehan, 1993; Panos, Jackson, Hasan, & Panos, 2014). Currently, there is limited empirical literature on the effect of behavioral treatment

randomized control trials (RCTs) on the HFO population which necessitates further investigation.

Theoretical Model

The basis for the application of DBT to determine its effect on recidivism among recently incarcerated homeless women requires an understanding of the conceptualizations that structured the application of the behavioral treatment programs. The Lazarus Schema of Coping and Adaptation (Lazarus & Folkman, 1984) and the Schlotfeldt Health Seeking and Coping Paradigm (Schlotfeldt, 1981) was adapted to form a nurse-specified, multidimensional theoretical framework known as The Comprehensive Health Seeking Coping Paradigm (CHSCP). The CHSCP model guided the development of the study, the selection of interventions and selection of variables that can influence the health seeking and coping behaviors of clients (Nyamathi, 1989) which included sociodemographic factors, social, situational, personal, and health seeking and coping methods.

In application of the CHSCP model, sociodemographic factors such as age, race/ethnicity, education, and employment status were investigated. Social factors such as limited access to emotion regulation strategies and devaluation and discrimination scores, and health seeking factors such as desire for help and treatment readiness were also considered. Significant situational factors include homelessness (Nyamathi et al., 2011) and history of incarceration and criminality. Personal factors such as a history of depression, PTSD scores, drug and substance use, impulse control difficulties, lack of emotional awareness, and anger/hostility scores challenge the ability of recently released homeless female parolees/probationers to complete the community-based behavioral treatment programs and successfully reintegrate into society.

Purpose

This randomized controlled trial (RCT) was designed to explore the effectiveness of a criminal-focused dialectical behavioral intervention (DBT) program versus a health promotion (HP) program on the reduction of recidivism rates among 130 recently released, homeless female ex-offenders (HFOs) participating in community-based rehabilitation programs.

Methods

Design and Sample

In this RCT design, 130 HFOs residing in the community post incarceration were enrolled between February 2015 to May 2016. HFOs were included in the study if they met the following criteria: a) aged 18-60; b) had used drugs prior to their latest incarceration; and c) were considered homeless prior to discharge from incarceration. Among the 176 HFOs screened, 46 were excluded because they did not meet the screening criteria. The study was approved by the University's Human Subjects' Protection committee and registered with Clinical Trials.gov.

Site(s)

The participants resided in community shelter-based drop-in sites and residential drug treatment (RDT) programs in Los Angeles (LA) and Pomona, California.

Procedures

Homeless women who frequented the community-based recruitment sites were made aware of the study by means of approved flyers that were posted with permission of the program or site directors. The flyer provided a phone number and directed the interested potential participant to the research staff who were present at the site on select days. After a brief discussion of the study, among those interested, a brief consent script was read and signed. This

was followed by the administration of a brief screener by the research staff to assess eligibility criteria. Upon determination of study eligibility, a detailed informed consent was read and discussed by the research staff and all questions answered. Upon signing the consent form, a 45-minute baseline questionnaire was administered, followed by a confidential urinalysis to assess for current drug use (i.e., marijuana, methamphetamine, opiates, and cocaine). Participants were subsequently randomized into the three-month DBT or the HP programs. In total, compensation for screening (\$3), questionnaire completion (baseline (\$15), and follow-up (\$35) was provided in the amount of \$53 over a six-month period. Completion of group and one-on-one sessions resulted in additional compensation of up to \$41.

DBT Intervention Program

The development of the DBT and the HP programs utilized a community-based approach wherein academic partners, site directors, and social service staff molded the research design which was subsequently submitted and successfully funded. These stakeholders participated in the community advisory board (CAB) which also included criminal justice experts. The directive for the CAB was to design a semi-structured interview guide (SSIG) which would guide the questions asked to similarly released HFOs (Nyamathi et al., 2016). These data and the CAB sessions then assisted in the development of the two intervention programs (e.g., DBT and HP).

The design of the two programs both included six group sessions, composed of about 5-7 women, delivered predominantly by both a research nurse and a research community health worker (CHW). In addition, six one-on-one sessions, either before or after the group sessions, were delivered by either one of these research staff. Each session lasted on average 45-60

minutes over the three month period. Further, as the DBT included a case management component, ongoing contact with the research staff, who were available in private areas at the facility, was encouraged on a weekly basis over the six-month period.

The six DBT sessions focused on reduction of drug and alcohol use and strategies to avoid or eliminate use, strategies for coping positively and building a positive life despite the challenges the women experienced over a lifetime. The one-on-one sessions focused on discussing diary cards that the women wrote up weekly and discussion of challenges to meeting their targeted goals. The staff also assisted the participants of the DBT-CM in referrals (e.g., healthcare, housing, employment skills, etc).

HP Intervention Program

For participants recruited to the HP program, the focus was delivery of group and one-on-one sessions focused on chronic diseases which were topics of interest to women in our qualitative sessions. The six HP group sessions, conducted over the three month period, and were focused on the following: a) Diabetes; b) Heart Disease; c) Sexually Transmitted Infections, d) HIV/AIDS, e) Parenting skills and f) Community and Family Reintegration. Participants had up to 12 weeks to complete the HP group sessions; however, after 12 weeks, there was no ongoing meeting of the participants in relation to referrals and ongoing support.

Follow-up was conducted at six months post baseline and the research team attained a 90% follow up completion rate. Further, DBT group and individual sessions had a high session completion rate (87.7% and 90.3%, respectively). Comparably, the HP group and individual session completion rate were high (83.9% and 84.1%, respectively).

INSTRUMENTS

Sociodemographic variables measured included site, age, race/ethnicity, employment status, and education.

Incarceration history. The Lifestyle Criminality Screening Form (LCSF) (Walters, 1990; Walters, White, & Denney, 1991) was used to assess number of times in jail or prison and whether the last incarceration involved a violent offense. In addition, the data assessed also included whether the participant was currently on probation or parole. Sample items included “How many times have you been in jail in your lifetime OR How many times have you been in prison in your lifetime?” Recidivism was defined as responding “Yes” to the question “Have you been back to jail or prison within the past six months?” during the six-month follow-up interview.

Alcohol and drug use. The Texas Christian University Drug History (TCU) Form II (Institute of Behavioral Research, 2007) was used to ask about the frequency of alcohol and drug use in the past six months.

Coping behaviors. The 36-item Difficulties in Emotion Regulation Scale (DERS) was used to assess coping behaviors. This 5-point Likert scale included items that ranged from “almost never” to “almost always” (Gratz & Roemer, 2004). Subscales comprising DERS included Impulse Control Difficulties, Lack of Emotional Awareness, and Limited Access to Emotion Regulation Strategies., Difficulties Engaging in Goal-Directed Behavior, Non-acceptance of Emotional Responses, and Lack of Emotional Clarity. Cronbach alphas ranged from .80 to .89. A sample item included “When I am upset, I become out of control”.

Discriminatory beliefs. A 12-item Devaluation/ Discrimination Beliefs Scale (DBS) was used to assess discriminatory beliefs. Using a 6-point Likert scale, response options ranged from

(1) “strongly disagree” to (6) strongly agree” (with no fixed neutral point) (Winnick & Bodkin, 2008). A sample item included “Most people believe formerly incarcerated persons are just as trustworthy as the average person” and “Most people would not accept a person who has been to prison as a teacher in the public schools.” In the current study, the scaled items demonstrated a high internal reliability ($\alpha=0.80$) and the overall score was summed, resulting in an observed range from 17-70.

Depressive symptomology. The 10-item Center for Epidemiologic Depression Scale (CES-D) assessed how often an individual felt or behaved in the last week (Andresen, Malmgren, Carter, & Patrick, 1994). Sample items included “I was bothered by things that usually don’t bother me” and “I had trouble keeping my mind on what I was doing.” Responses included rarely or none of the time (less than 1 day), some of the time (3-4 days), occasionally or a moderate amount of the time (3-4 days), and most of the time (5-7 days), and were scored from 0 to 3, respectively. Scores were summed, resulting in a range from 0-30, with the suggested cut point of 10 or higher indicating significant depressive symptoms (Zhang et al., 2012) and a need for psychiatric evaluation. In this sample, the Cronbach’s α was .82.

Mental health index (MHI). A 5-item index assessed mental health (Stewart, Hays, & Ware, 1988). The Cronbach’s alpha was .87 for this study. Item scores are summed and linearly transformed to a 0 to 100 range with higher values indicated better emotional well-being.

Post-traumatic stress disorder (PTSD). Symptoms were assessed using four items from the Women’s Risk Needs Assessment (WRNA) (Wright, Van Voorhis, Bauman, & Salisbury, 2008). The scale asked about any experiences in the lifetime that were so frightening, horrible, or upsetting which triggered fear, flashbacks or frightening thoughts in the last month. Even if a participant scored “1,” it may indicate a serious mental health problem. Samples item

included “Have had nightmares about it OR thought about it when you did not want to” and “Were constantly on guard, watchful, or easily startled.” Responses included “yes or no.” In this sample, Cronbach’s α for this scale was .84.

Anger and hostility. Three items from the WRNA (Wright et al., 2008) assessed anger and hostility. Sample questions included: “Would you describe yourself as having a strong temper?” and “Were you angry or upset when you committed the present offense?” Cronbach’s alpha for anger was .61. Responses included “yes” or “no.”

Desire for help. Six items from Criminal Justice Client Evaluation of Self and Treatment (CJ-CEST) scale used a five-point Likert scale to assess desire for help with response options ranging from “strongly disagree” (1) to “strongly agree” (5) (Institute of Behavioral Research, 2007). Sample items include “You need help in dealing with your drug use” and “You want to get your life straightened out.” The score for this six item scale was averaged and then multiplied by 10 in order to rescale final scores in the range of 10 to 50.

Treatment readiness. An eight item scale from CJ-CEST form using a five-point Likert scale assessed treatment readiness with response options ranging from “strongly disagree” (1) to “strongly agree” (5) (Joe, Broome, Rowan-Szal, & Simpson, 2002). Sample items include “This treatment is giving you a chance to solve your drug problems” or “You are not ready for this kind of treatment.” Answers to the eight items were averaged, reverse coded when needed, and then multiplied by 10 in order to rescale the final scores so they range from 10 to 50.

DATA ANALYSIS

The purpose of this pilot study was to describe the differences in recidivism during the six months post-randomization period between the DBT-CM and HP groups. Given the

relatively small sample size, we first examined differences in the distributions of baseline predictors that may have been due to chance (Altman, 1985). Differences between the two groups were evaluated using the χ^2 test and the Fisher's exact test for categorical variables and the Student's t-test for continuous variables. Variables with $P < 0.25$ were considered imbalanced and evaluated as potential confounders in the final multivariable models.

Recidivism at six months was compared between the DBT and HP groups using multivariable Poisson regression models with robust variance (Marschner & Gillett, 2012; Zou, 2004). Poisson regression models can generate unbiased estimates of risk ratios for binary outcomes and are preferable to logistic regression models for cohort studies and randomized controlled trials when high prevalence of the outcome leads to inflated estimates of the relative risk when odds ratios are used (Marschner & Gillett, 2012; Zou, 2004). These models were used to generate risk ratio estimates while adjusting for covariates to account for imbalance between DBT and HP groups. A binary variable representing recidivism was defined as the dependent variable and the assigned group was defined as the primary independent variable (coded 1 for DBT and 0 for HP). The final models included all variables with imbalanced distribution between DBT and HP groups ($P < 0.25$ in Table 1). Tolerance estimates were >0.7 for all coefficients, suggesting no multicollinearity. Four observations were found to be outliers based on Cook's distance $> 4/116$ (0.034) for the main model of all participants. Removing these observations did not alter our findings.

Three models were fitted for the following study groups: a) all participants; and b) participants age < 50 years; and 3) participants with Desire for Help score > 35 . The age subgroup was selected after observing that very few participants in the upper quartile age of ≥ 50 years were incarcerated during the follow-up period. For the Desire for Help subgroup, we

reasoned that the differences between the two groups might be more pronounced among participants who are at more advanced levels of readiness to change. The lower quartile of the Desire for Help score (> 35) was chosen as the cutoff for this subgroup.

We used the data from this pilot trial to estimate the sample size needed for a definitive randomized controlled trial of DBT vs. HP on recidivism among formerly-incarcerated homeless women. Estimates were generated to achieve 90% power for detecting differences in proportions using two-sided tests at alpha of 0.05.

R version 3.3.0 was used for all analyses. As this was a pilot trial, we report point estimates, 95% confidence intervals (CIs), and *P* values without specifying an alpha criteria for statistical significance (Greenland et al., 2016).

RESULTS

Characteristics of the Sample

Overall, 65 participants were randomized to each of the DBT and HP groups. Table 1 shows the participants' baseline characteristics. The majority of the participants were Black or Latino, and about 30% had completed less than high school education. In terms of incarceration characteristics, over half of the participants had a history of incarceration in prison (vs. jail only), and about one-third reported violent crime as the reason for the latest incarceration. The majority of the participants reported using drugs or alcohol during the six months prior to the interview.

Compared to the DBT group, participants in the HP group were more likely to report longer time since last exit from prison or jail ($P = 0.043$). No differences were found in terms of level of unemployment, or the devaluation and discrimination score ($P = 0.208$). Recidivism was reported among 9/58 (15.5%) and 12/58 (20.7%) participants in the DBT and HP groups,

respectively (RR = 0.75; 95% CI = 0.34 - 1.64; P = 0.469). Among participants with recidivism, mean (SD) days from baseline to incarceration was 153 (80) and 86 (80) for DBT and HP groups, respectively (P = 0.073).

[Insert Table 1 here]

Multivariable Analysis

Table 2 shows the results of the final regression models, which included the following covariates to account for imbalance: enrollment site, employment status, Devaluation and Discrimination score, and months since last incarceration. The model for all participants (Model 1) estimated a 41% reduction in recidivism among DBT vs. HP participants (RR = 0.59; 95% CI = 0.26 - 1.35; P = 0.208). The reduction in recidivism in the DBT group was more pronounced in the model for participants age < 50 years (Model 2; RR = 0.46; 95% CI = 0.19 - 1.11; P = 0.085) and the model for participants with Desire for Help score > 35 (Model 3; RR = 0.40; 95% CI = 0.16 - 1.00; P = 0.050).

[Insert Table 2 here]

Estimated Risk for Recidivism

Figure 1 shows the estimated sample size needed for a RCT of DBT vs. HP interventions on recidivism among formerly incarcerated homeless women. A total sample size of 800 women (400 each for DBT and HP groups) would be needed in the final analysis dataset assuming 20.7% recidivism in the HP group and 12.2% recidivism in the DBT group (Figure 1, Point A). If the trial is restricted to women age < 50 years, a total sample size of 304 women (152 in each group) would be needed assuming 27.3% recidivism in the HP group and 12.6% recidivism in

the DBT group. If the trial is restricted to women with Desire for Help scores > 35, a total sample size of 212 women (106 in each group) would be needed assuming 30.0% recidivism in the HP group and 12.0% recidivism in the DBT group.

[Insert Figure 1 here]

DISCUSSION

The purpose of this exploratory study was to assess effectiveness of the DBT program in reducing recidivism among HFOs who were randomized into the DBT as compared to the UC program. Our findings revealed that the DBT participants had a reduction in recidivism. Given that women face a myriad of challenges existing jail and prison, which includes poverty, social stigma, and resource scarcity (Lilliott, Trott, Kellett, Green, & Willging, 2017; Salem, Nyamathi, Idemundia, Slaughter, & Ames, 2013), returning back to prison is a clear and pressing risk (Solinas-Saunders & Stacer, 2017) for those during reentry.

To our knowledge, this is the first study to report on the outcome of a gender-sensitive intervention program targeted to female HFOs that incorporates nurses, ex-offending female peer coaches and community-based methods. In our sample, the DBT intervention had a greater impact on risk of returning to jail and/or prison for younger women as compared with older participants. This is a critical finding in that DBT participants who were younger may have benefited more from the program as compared with older HFOs. While older women were less likely to be reincarcerated overall, they may not need and/or benefit from the intervention as much as younger HFOs.

In particular, the DBT intervention core components may have more readily targeted areas of need for younger women as compared with older HFOs. For instance, it is plausible that

the DBT intervention, which incorporated teaching coping skills, addressed substance use and employment referrals, were successful in assisting younger women navigate reentry and maintain a successful six-month community follow-up. Among older HFOs, it may be likely that there are a different set of behavioral and health-related needs which are contributing factors to recidivism which challenge the transition between jail/prison and the community. Both younger and older age cohorts have distinct needs and the DBT-CM intervention may need to be tailored for each group rather than consistently applied across the lifespan. Further, different factors may be contributing to older HFOs returning to jail and/or prison as compared with younger HFOs.

The effect of DBT on recidivism was stronger among HFOs who reported a higher desire for help score as compared with those who had a lower desire for help score. This is a critical finding, in that those who have a desire for help score may be more likely to want to make positive strides, pursue referrals made by the peer coach/RN team, and utilize learned coping skills. Moreover, readiness to change cannot be underestimated as it has the power to decrease the cyclical pattern of returning to jail and/or prison.

Utilizing the stages of change model (Prochaska et al., 1994), one method to help move HFOs into a contemplative state of behavior change is motivational interviewing (MI) which has been found to be efficacious in treatment of substance use disorders (Apodaca & Longabaugh, 2009). In particular, MI is known as a client-centered counseling approach (Rollnick & Miller, 1995) which has been applied to young adults at risk for substance use (D'Amico, Miles, Stern, & Meredith, 2008), psychiatric in-patients (Baker et al., 2002), and among those with schizophrenia and alcohol use disorders (Graeber, Moyers, Griffith, Guajardo, & Tonigan, 2003). In the future, it is plausible that a DBT-CM + MI intervention would be effective in aiding those who have a low desire for help score.

While this study is limited to a heterogeneous cohort of women aged 19-64 in Los Angeles and Pomona, which includes women both on probation and parole, these findings demonstrate the need for refining our DBT based on younger versus older women, along with influencing readiness to change. Without doubt, our pilot study has provided critical information related to feasibility as we achieved a 90% follow up rate at six months.

Public Health Implications

HFOs transitioning into the community are at a vulnerable crossroads whereby there is a high risk of recidivism and low risk of success sustaining the community transition. Informed by our previous research with this community (Nyamathi et al., 2017; Salem, Nyamathi, Keenan, et al., 2013), the current study has shown early promise at mitigating recidivism at six months. Building upon these findings will necessitate integrating MI into the DBT intervention to address desire for help and to gain a greater understanding of differences which influence recidivism among younger versus older women during reentry. Peer coaches/nurses are in a unique position to implement the DBT + MI intervention model because the semi-structured interviews provide an environment that fosters candid communication of the HFOs with peers and nurses.

Future studies not only necessitate a larger sample size, but also would extend for a longer follow-up period, possibly one year with continuous staff involvement. Further, it is critical to engage a multidisciplinary team which is composed of nurses, criminal justice experts, psychologists, and community based stakeholders work together in long term mitigation of recidivism. With policy changes such as the recently implemented removal of the criminal history box on job applications for companies throughout Los Angeles (Lustman, 2016) and other potential areas such as on college applications (U.S. Department of Education, 2016) there

is a positive shift towards an easier reentry of HFOs to the community. This could be the impetus that removes the stigmatization of being an HFO, thus giving them a fair opportunity to thrive and realize their full potential.

Table 1. Baseline Characteristics of Participants Randomized to Health Promotion and Dialectical Behavior Therapy groups (N = 130).

Characteristic		Health Promotion (N = 65) n (%)	Dialectical Behavior Therapy (N = 65) n (%)	P
Sociodemographic Factors				
Site	Residential Drug Treatment 1	13 (20%)	14 (21.5%)	0.245
	Drop-In Site	14 (21.5%)	7 (10.8%)	
	Residential Drug Treatment 2	38 (58.5%)	44 (67.7%)	
Age in years	Mean (SD)	38.6 (11.3)	39.1 (11.5)	0.806
Race/Ethnicity	White	11 (16.9%)	7 (10.8%)	0.703
	Black	24 (36.9%)	29 (44.6%)	
	Latino	26 (40%)	26 (40%)	
	Other	4 (6.2%)	3 (4.6%)	
Education	< 12 years	18 (27.7%)	21 (32.3%)	0.715
	≥ 12 years or GED	26 (40%)	27 (41.5%)	
	College, vocational, or higher	21 (32.3%)	17 (26.2%)	
Employment status	Unemployed	51 (78.5%)	57 (87.7%)	0.242
	Employed	14 (21.5%)	8 (12.3%)	

Table 1 Continued

Characteristic		Health Promotion (N = 65) n (%)	Dialectical Behavior Therapy (N = 65) n (%)	P
Incarceration Characteristics				
Months since last prison/jail exit	Mean (SD)	16.3 (38)	6.1 (10.4)	0.043
Number of times in prison	None	30 (46.2%)	29 (44.6%)	0.343
	One time	16 (24.6%)	12 (18.5%)	
	2-4 times	13 (20%)	11 (16.9%)	
	5 or more times	6 (9.2%)	13 (20%)	
Last incarceration due to violent offense		24 (36.9%)	18 (27.7%)	0.348
Lifetime criminality score	Mean (SD)	8.4 (3.5)	8.7 (2.5)	0.624
Substance Use				
Any drug use (self-report + urine)		45 (69.2%)	44 (67.7%)	1
Any substance use (drug or alcohol)		48 (75.0%)	45 (70.3%)	0.697
Social and Behavioral Factors				
Impulse Control Difficulties	Mean (SD)	14 (5.7)	13.5 (5.4)	0.669
Lack of Emotional Awareness	Mean (SD)	13.6 (5.3)	14.1 (5.5)	0.583
Limited Access to Emotion Regulation Strategies	Mean (SD)	17.3 (7)	17.1 (6.5)	0.836
Devaluation and discrimination score	Mean (SD)	47.3 (10.8)	44.8 (11.5)	0.208
CES-D depression score	Mean (SD)	9.6 (6.1)	9.6 (6.7)	0.967
Mental health index	Mean (SD)	68 (22.6)	67.6 (23.1)	0.927

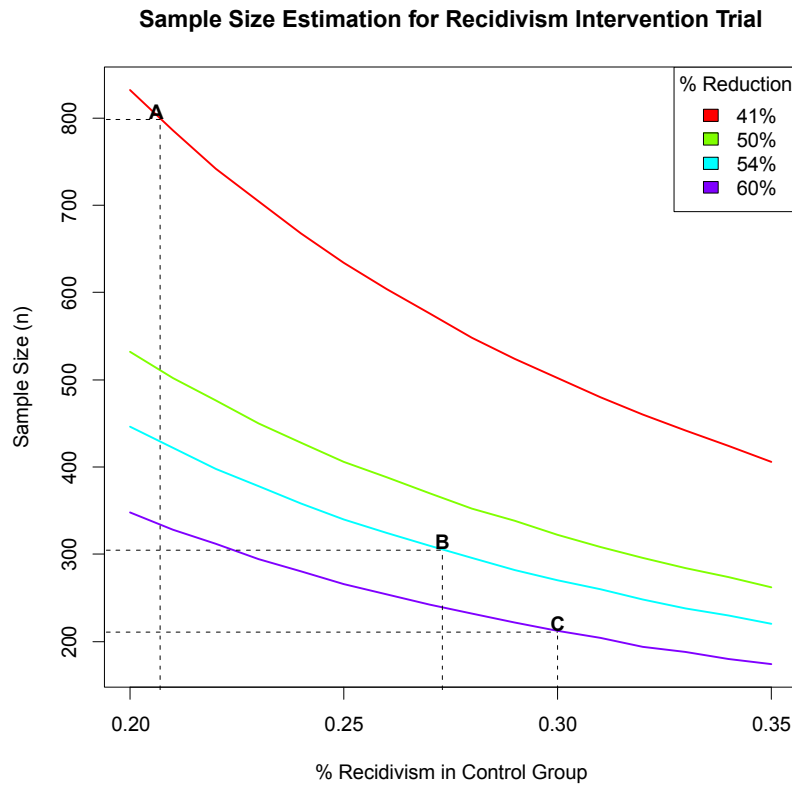
Table 1 Continued

Characteristic		Health Promotion (N = 65) n (%)	Dialectical Behavior Therapy (N = 65) n (%)	P
Social and Behavioral Factors (continued)				
PTSD score	Mean (SD)	1.8 (1.6)	1.5 (1.6)	0.289
Anger/hostility score	Mean (SD)	1.5 (1.2)	1.4 (1.1)	0.817
Desire for help score	Mean (SD)	39.1 (10.5)	40.5 (9.5)	0.425
Treatment readiness score	Mean (SD)	40.4 (7.9)	40.1 (9.5)	0.822

Table 2. Effect of DBT intervention on recidivism controlling for potential confounders (different distribution between program group with $P < 0.25$ as indicated in Table 1)

	Model 1 All participants		Model 2 Age < 50 years		Model 3 Desire for Help Score > 35	
	Adjusted Risk Ratio (95% confidence interval)	<i>P</i>	Adjusted Risk Ratio (95% confidence interval)	<i>P</i>	Adjusted Risk Ratio (95% confidence interval)	<i>P</i>
Program						
HP	1.00	-	1.00	-	1.00	-
DBT	0.59 (0.26-1.35)	0.208	0.46 (0.19-1.11)	0.085	0.4 (0.16-1.00)	0.050
Site						
DWC + Amistad	1.00	-	1.00	-	1.00	-
Prototypes	2.22 (0.73-6.72)	0.158	3.26 (0.58-18.27)	0.178	2.28 (0.71-7.36)	0.168
Employment in household						
No	1.00	-	1.00	-	1.00	-
Yes	0.50 (0.10-2.54)	0.405	0.42 (0.08-2.23)	0.308	0.78 (0.14-4.45)	0.782
Devaluation and discrimination score (+1)	0.98 (0.95-1.01)	0.259	0.99 (0.95-1.02)	0.445	0.97 (0.94-1.00)	0.064
Months since last incarceration (+1)	0.57 (0.13-2.46)	0.451	0.51 (0.11-2.38)	0.391	0.84 (0.22-3.24)	0.797

Figure 1. Sample size estimates for a randomized controlled trial of Dialectical Behavior Therapy (DBT) – CM versus Health Promotion (HP) intervention on recidivism among formerly incarcerated homeless women.



Each line represents sample size needed assuming an intervention that achieves the specified reduction in recidivism rates at six months for the DBT group and percent recidivism among the control group (HP). Sample size estimates reflect the total sample size of participants (DBT and HP) for achieving 90% power and a two-sided test of proportions at alpha of 0.05. Point A represents the sample size needed for (N = 800) based on the assumptions drawn from the model for all participants in the pilot trial (20.7% recidivism among HP and 12.2% recidivism among DBT participants [41% reduction]). Point B represents samples size needed for the subgroup with age < 50 years (N = 304; 27.3% recidivism among HP and 12.6% recidivism among DBT [54% reduction]), and point C represents samples size needed for the subgroup with desire for help score > 35 (N = 212; 30.0% recidivism among HP and 12.0% recidivism among DBT [60% reduction]).

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