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A multi-site comparison of supported housing for chronically homeless adults: “Housing first” versus “residential treatment first”

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Abstract

Both direct placement in supported community housing and pre-treatment with time-limited residential treatment are used as approaches to helping chronically homeless adults exit from homelessness but relative effectiveness and cost remains untested. The current observational study utilized data from a national, multi-site housing project to determine whether clients who receive residential treatment or transitional housing before being placed into independent housing achieve superior outcomes than clients who are immediately placed into independent housing, and whether they incur greater healthcare costs. A total of 709 participants (131 and 578 participants in the respective groups) were assessed every 3 months for 2 years on housing outcomes, community adjustment, work and income, mental and physical health, and health service costs. Clients who received immediate, independent housing had more days in their own place, less days incarcerated, and reported having more choice over treatment; but no differences on other clinical or community adjustment outcomes. In this observational study, there were no clinical advantages for clients who had residential treatment or transitional housing prior to entry into community housing, but they incurred higher substance abuse service costs. Studies using randomized controlled trials of these conditions are needed to establish causation.

Keywords

Homelessness; Residential treatment; Supported housing; Healthcare costs; Substance Abuse

Introduction

Although homelessness has been a prominent health and policy issue among adults with severe mental illness and addictive disorders for over two decades (Drake, Osher, & Wallach, 1991; President's New Freedom Commission on Mental Health, 2003; Rosenheck,

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Kasprow, Frisman, & Liu-Mares, 2003), the question that remains is when and how supported housing and/or residential treatment should be offered to this population (Brunette, Mueser, & Drake, 2004; Leff, et al., 2009). Supported housing is broadly defined as independent housing in the community with provision of mental health support services (Carling, 1992). Traditionally, clinicians and researchers have advocated for transitional/residential treatment, where there is group living and on-site staff, to “prepare” or transition clients to more independent living arrangements (Parkinson, Nelson, & Horgan, 1999; Ridgway & Zipple, 1990). Some have argued that these programs are practical cost-effective alternatives to time-limited independent housing or hospitalization (Anderson, 1999; Fenton, Mosher, Herrell, & Blyler, 1998; Hawthorne, et al., 2005; McHugo, et al., 2004). Others, however, view transitional/residential treatment as unnecessary, inappropriate, and expensive (Carling, 1992; Hogan & Carling, 1992; Tsemberis, Gulcur, & Nakae, 2004). This issue is important in light of the diminishing supply of low-cost housing in the past two decades (Boyer, 1987; Carling, 1993) and national concern about providing optimal services in response to continued adult homelessness (National Center on Homelessness Among Veterans, 2009; Obama Administration, 2009).

Some researchers have suggested that one of the biggest problems with the dismantling of state hospitals is that clients who need structured care and residential support no longer have access to such services (Belcher & DeForge, 1997; Dewees, Pulice, & McCormick, 1996). Studies have shown that some clients can have better psychosocial outcomes living in residential programs than clients living independently, especially for addiction disorders (Brunette, et al., 2004; Goldfinger, et al., 1999).

However, a housing treatment model called Housing First is increasingly being adopted by communities nationwide. The Housing First program, as its name suggests, offers homeless clients immediate independent housing off the streets and attempts to find housing that satisfies their needs and preferences (Tsemberis, 1999) with only limited requirements for psychiatric treatment or sobriety. A few studies conducted by the developers of this program in New York have found that Housing First can lead to higher housing-retention rates, treatment utilization, and self-reported choice than standard programs with no allocated community housing resources; but no differences were found on psychiatric, substance abuse, or community adjustment outcomes (Tsemberis, 1999; Tsemberis & Eisenberg, 2000; Tsemberis, et al., 2004). But for the most part, these studies did not compare Housing First to transitional housing with available, post-discharge community housing resources. National and state policy is shifting towards Housing First model programs, but various stakeholders, including clients, family members, researchers, and clinicians, have expressed concern about the lack of housing support and structure with such approaches (Lamb, 1995; Pulice, McCormick, & Dewees, 1995; Tsai, Bond, Salyers, Godfrey, & Davis, in press). A recent review of the literature suggests promulgation of the Housing First approach may be premature, especially for clients with serious substance abuse problems (Kertesz, Crouch, Milby, Cusimano, & Schumacher, 2009).

The current study utilized data from a comprehensive national, multi-site demonstration program for chronically homeless adults to address the following question: Do clients who receive residential treatment or transitional housing before being placed into independent housing achieve superior housing and/or clinical success than clients who are immediately placed into independent housing? Two previous studies conducted on supported housing programs at Department of Veteran Affairs (VA) medical centers have reported mixed results. One study examined 655 veterans with severe mental illness and found no difference in outcomes between clients who had received prior residential treatment and clients placed directly into permanent supported housing (Mares, Kasprow, & Rosenheck, 2004). However, that study was based on administrative data and generalizability of the results may

have been limited to VA settings. The other study, an evaluation of 589 clients in a VA housing subsidy program, found clients who received “multistage housing” showed greater improvements in substance use, quality of life, and social support over time than clients who were directly placed into independent housing, albeit at substantially greater cost (O’Connell, Kaspro, & Rosenheck, 2009).

The current observational study aims to further contribute to this literature by examining a broader sample of clients (e.g., non-veterans as well as veterans), 11 different treatment settings, and a range of outcomes. It was hypothesized that clients who received residential treatment or transitional housing before being placed into independent housing would incur more costs over time, but would have better psychosocial and substance abuse outcomes than clients who were placed immediately into independent housing. Furthermore, it was hypothesized that this group difference would be most evident for participants with substance use problems.

Methods

Program and Sample

The current study utilized data from the Collaborative Initiative to Help End Chronic Homelessness (CICH). The United States Interagency Council on Homelessness implemented CICH in 2004 to provide up to 5 years of funding from the Departments of Housing and Urban Development, Health and Human Services, and Veterans Affairs to 11 sites to provide adults who were chronically homeless with permanent housing and supportive primary healthcare and mental health services. Criteria for eligibility as “chronically homeless” were defined as “an unaccompanied homeless individual with a disabling condition who has either been continuously homeless for 1 year or more or has had at least four episodes of homelessness in the past 3 years.” The 11 communities funded through CICH included Chattanooga, TN; Chicago, IL, Columbus, OH; Denver, CO, Fort Lauderdale, FL; Los Angeles, CA; Martinez, CA; New York, NY; Philadelphia, PA; Portland, OR; and San Francisco, CA. Each site developed a comprehensive plan to reduce the prevalence of chronic homelessness through partnerships among providers in their communities. The specifics of these plans vary across communities (Mares & Rosenheck, 2009) but each plan included strategies for providing permanent housing, linking comprehensive supports with housing, increasing the use of mainstream services, integrating system and services, and ensuring the sustainability of these efforts.

Out of 1,242 clients who enrolled in the program, 734 (59.1%) participants gave informed consent to participate in the national evaluation of the project with the number of participants at each site ranging from 52 to 98 with an average of 69 participants per site. Homeless adults were recruited by clinical and research staff at each site through a variety of methods, including community outreach and contacts with shelters, hospitals, and other mental health agencies. Participation in the evaluation was completely voluntary and did not influence receipt of housing or services provided. Compared to clients who did not participate, clients who did participate were generally older, more likely to be male and Black, and more likely to have a medical or mental health problem.

Among participants who consented to participate in the evaluation, 709 (93.8%) had at least one follow-up assessment in the program and the current study focused on these participants during their first 2 years of program participation. Although limited data are available for these participants beyond 2 years, there was increasing attrition thereafter and it was reasoned that this time frame would be most appropriate to identify differences between the two groups.

Procedures

After participants gave informed consent, assessments were conducted by CICH and clinical staff at each site through face-to-face interviews and self-report measures. Assessments were conducted at baseline and every 3 months for 2 years. Participants were paid \$15 per assessment. All procedures were approved by the Institutional Review Boards at the parent site and at each participating site.

Measures

Individual characteristics—Characteristics of participants were collected at baseline by CICH staff through a structured interview form that documented sociodemographic information, psychosocial history, and clinical health information. Medical, mental health, and substance abuse diagnoses reported by participants were corroborated by assessing clinicians and administrative data.

Housing—Participants were asked at each interview the number of days during the past 3 months that they were housed in each of nine settings. The number of days living in their own place was defined as days in their own apartment, room, or house. The number of days living somewhere else was defined as days in a hotel, single room occupancy, or someone else's place. The number of days living in transitional/residential housing was defined as days in a halfway house, residential program, or some transitional housing focused on moving to permanent housing. Days incarcerated were days spent in jail or prison. Nights spent in shelters, outdoors, in vehicles, or abandoned buildings were classified as days homeless.

Community adjustment—To evaluate whether participants engaged in integrated community activities, participants were asked whether they had participated in each of 16 common activities (e.g., visit with close friends/relatives/neighbors, visit a grocery store, go to a restaurant, go to a theater/museum/cultural event, go to a health/exercise club/gym) during the previous 2 weeks (Katz, 1963). The total number of these activities was summed for a score ranging from 0 to 16 with higher scores indicating greater participation in community activities.

Social support networks were assessed by questions asking the number of types of persons who would be available to help participants regarding three different types of assistance: a short-term loan of \$100, a ride to an appointment, or someone to talk with if they felt suicidal (Vaux & Athanassopoulou, 1987). The total mean number of types of persons was calculated with scores ranging from 0 to 10.

Participants' subjective quality of life was assessed with one item (Lehman, 1988) asking participants to rate their life on a 7-point scale from 1 (terrible) to 7 (delighted). Choice in mental health and substance abuse services was measured using a 5-item consumer choice scale (Monahan, et al., 2005). Clients were asked whether they had received any services in the past 3 months, and if so, how strongly they agreed to statements like "I felt free to do what I wanted about going to treatment" and "I chose to go for treatment" from 1 (strongly disagree) to 5 (strongly agree). Adequate internal consistency was found ($\alpha = 0.89$), and the scale score was the mean of the items.

Participants who were living in their own places were asked to report their level of satisfaction with their housing using a 20-item scale developed for the Substance Abuse and Mental Health Services Administration Supported Housing Initiative (Center for Mental Health Services, 2001; Tsemberis, Rogers, Rodis, Dushuttle, & Skryha, 2003). Participants were asked to rate on a 5-point scale how satisfied they were on items such as "the amount

of choice you had over the place you live”, “how close you live to family and friends”, and “the safety of your neighborhood” from 1 (very dissatisfied) to 5 (very satisfied). The scale score was the mean of the items.

A 7-item therapeutic alliance scale was used to measure the strength of the relationship experienced by participants with their primary mental health or substance abuse provider (Neale & Rosenheck, 1995). Participants were asked to identify a primary provider and to rate on a 7-point scale statements like “how often does your provider perceive accurately what your goals are?” and “how often are the goals of your work with your provider important to you?” from 0 (never) to 6 (always). Good internal consistency was found ($\alpha = 0.94$), and the scale score was the mean of the items.

Work and income—Participants were also asked whether they worked in the past month, the average number of hours worked weekly, and the amount of employment income they received. Clients were further asked whether they had received any of several types of public support income during the past month, and if so, the amount of such income.

Substance abuse—The Addiction Severity Index (ASI; McLellan, Luborsky, Woody, & O'Brien, 1980) consisting of 6 items on an alcohol sub-scale and 13 items on a drug-subscale, was used to document alcohol and drug use and expenditures in the past month. Items are combined in a standard comparable score ranging from 0 to 1 for each subscale and higher scores reflect more serious substance use.

Mental and physical health status—The Medical Outcomes Study Short Form-12 (SF12; Ware, Kosinski, & Keller, 1998), consist of 12 items and a mental health and physical health subscale, was used to assess the overall level of functioning in those respective domains. Scores range from 0 to 100, and a score of 50 representing the normal level of functioning in the general population with each 10-point interval representing one standard deviation. The SF12 has been validated as an outcome measure in homeless populations (Larson, 2002).

Three subscales of the Brief Symptom Inventory (BSI; Derogatis & Spencer, 1982) were selected to measure the major domains of subjective distress: psychoticism, depression, and anxiety. Respondents rate from 0 (never experience symptom) to 4 (very often experience symptom) 16 items like “nervousness or shakiness inside” and “the idea that someone else can control your thoughts.” In this study, the BSI showed excellent internal consistency with $\alpha = 0.92$, and the BSI score presented is the mean value for the three sub-scales.

An observed psychotic behavior rating scale (Dohrenwend, 1982), consisting of 10 types of behaviors (e.g., hallucinations, delusions, inappropriate behavior or speech), were rated by evaluation staff based on their observations during interviews. Each of these behaviors was coded 0 (not at all) to 3 (a lot) based on staff observations, and the total scale score was computed as the average score across these 10 items ($\alpha = .76$).

Service costs—Participants were asked detailed questions about the total number and type of medical, mental health, and substance abuse treatment visits made during the past 3 months. From this information, service costs were estimated for four aggregated types of care: medical/dental treatment, mental health services, substance abuse services, and the total for all three types of services. Inpatient, emergency room, and outpatient costs were differentiated within each of the aggregate services. Estimates were computed by multiplying the number of visits/days of care reported by standard estimates of the unit cost of each type of care. Unit costs were estimated on the basis of data compiled for a recent

NIMH-funded cost-effectiveness study of treatment of schizophrenia (Rosenheck, et al., 2006).

Data Analysis

Frequency analyses were conducted to examine the distribution of days participants spent in residential or transitional housing in the period 3 months before and after baseline assessment. A cut-off point was identified at 2 weeks with the rationale that this was the minimum dose that could be expected to influence outcomes and that only 23 (17.6%) participants in residential treatment had spent less than 2 weeks in transitional/residential treatment would be excluded. Based on this, participants were separated into two groups: Residential Treatment First (RTF) consisting of participants who had stayed in transitional/residential treatment for two weeks or more 3 months before or after entry into CICH (mean= 47.4 (33.6) days in residential treatment), and Independent Housing First (IHF) consisting of participants who had no (mean= 0.0) days of transitional/residential treatment 3 months before or after entry into CICH. The proportion of participants at baseline in each group by site were examined with a Chi-square test and found to be significant ($X^2= 62.94$, $p<.001$). As a result, all regression analyses detailed below included site as a covariate to control for potential site effects. Differences in attrition between groups over time were also examined and no significant difference was found ($X^2= 4.13$).

Since RTF participants may differ in ways that may confound outcome comparisons, background differences and baseline values of all outcomes were evaluated between participants with *t* tests and Chi-square. Levene's test for equality of variances was used to test for homogeneity of variances and adjustments to *t*-tests were made accordingly. A log transformation was conducted on health service cost variables to better normalize the data before analyses were conducted.

Mixed linear regression models were used to test differences between the RTF and IHF groups over time while controlling for potentially confounding baseline covariates. Mixed linear regression is used to analyze longitudinal data with repeated measures and is particularly useful for handling missing data and varying measurement times. A first-order autoregressive covariance (AR1) structure was specified as it was assumed that correlations between repeated measurements would decrease as they became farther apart in time. Effect sizes using Cohen's *d* were estimated from *F* statistics and mean sample sizes (Thalheimer & Cook, 2002).

Two supplemental regression model analyses were conducted in addition to the main analyses. The above analyses were repeated on only participants with a substance use disorder at baseline, and participants with a substance use disorder at baseline were compared with participants with no substance use disorder at baseline. In both these analyses, background differences between groups were evaluated and controlled for.

Results

Baseline characteristics

Background characteristics and outcome variables of all participants at baseline are shown in Table 1. As expected, the RTF group had significantly more days in transitional/residential treatment in the past 3 months as this was how the groups were defined. There were a few other significant group differences found, but all suggesting more severe problems among the RTF group: a greater proportion of RTF participants were homeless more than 4 times in the past 3 years, and were identified as having alcohol or drug abuse problems. They spent fewer days in their own place in the past 3 months and fewer days housed elsewhere. They had greater mental health and substance abuse service costs, and

higher BSI scores. However, the IHF group had significantly more days homeless in the past 3 months. These 9 baseline differences along with the study site were included as covariates in the main analyses detailed below.

Outcomes

Table 2 shows the results of the linear mixed regression analyses controlling for the 10 covariates listed above. The IHF group stayed significantly more days in their own place over time than the RTF group (Cohen's $d=0.4$), however there was no significant group*time interaction effect indicating no greater rate of improvement occurred for the IHF group. Also the RTF group showed significantly more days in transitional/residential treatment over time (Cohen's $d=0.6$), but a more rapid decrease than the IHF group (Cohen's $d=0.4$). The IHF group had significantly less days incarcerated over time than the RTF group (Cohen's $d=0.2$); a significant interaction effect was found (Cohen's $d=0.2$) because the RTF group had less days incarcerated at 18 months.

However, there were no significant group differences on the ASI- Alcohol or ASI- Drug scores, participant substance abuse expenditures, or other measures of mental health and community outcomes. The IHF group, however, reported experiencing significantly more choice about treatment. Finally, the RTF group incurred higher substance abuse service costs than the IHF group (Cohen's $d=0.3$). When this was examined in further detail, the majority (73.2%) of the substance abuse service costs incurred by the RTF group was spent on inpatient costs followed by 19.2% spent on peer support groups (e.g., Alcoholics Anonymous).

To examine the suppression effects of covariates, regression analyses were repeated with no covariates included in the model except the baseline values of outcome measures. Results were mostly similar, except days housed elsewhere became significant in favor of the RTF group, there was an interaction effect on substance abuse service costs, and there was no group effect on days incarcerated.

Regression analyses were repeated on only the 402 (70.5%) IHF and 101 (83.5%) RTF participants who were diagnosed with an alcohol or drug use disorder at time of program entry, controlling for site and baseline differences on proportion of participants recently homeless for one year or more, proportion of participants homeless 4 times or more in the past 3 years, days housed elsewhere in past 3 months, days homeless in past 3 months, brief symptom inventory scores, and substance abuse service costs. The main results remained the same, i.e., the IHF group had more days housed and there were no differences in substance abuse, clinical, or community outcomes. However, there was no longer a significant group effect on choice, days incarcerated, the group effect on days incarcerated became non-significant ($p=.05$), and there was a significant difference on housing satisfaction with the RTF group reporting greater satisfaction.

Since the main difference between the RTF and IHF groups was in substance use, a further set of analyses evaluated differences between participants with a substance use disorder at baseline with participants who had no substance use disorder at baseline. There were many baseline differences, including age, mental health diagnosis, days in transitional/residential treatment in past 3 months, days homeless in past 3 months, lifetime incarceration, days incarcerated in past 3 months, observed psychotic behavior ratings, proportion homeless 4 times or more in past 3 years, proportion homeless in past year, social support, number of integrated community activities, and all substance abuse variables. A regression analysis controlling for site and these baseline differences (excluding substance abuse variables) showed that participants with a substance use disorder showed significantly higher scores on the BSI, $F(1,461.1)=22.7, p<.00$, SF12- mental, $F(1,597.0)=11.3, p<.00$; ASI- alcohol,

$F(1,466.6)= 33.3, p<.00$; ASI- drug, $F(1,492.9)= 29.3, p<.00$; reported higher expenditures on alcohol, $F(1,504.3)= 7.84, p=.01$; higher expenditures on drugs, $F(1,983.0)= 12.5, p<.00$; incurred higher substance abuse service costs, $F(1,579.5)= 45.9, p<.00$; and higher total health service costs over time, $F(1,630.2)= 5.6, p=.02$. Across all time points, participants with a substance disorders spent on average, \$23.8 ($sd= 71.4$) on alcohol and \$44.2 ($sd= 217.6$) on drugs monthly compared to participants with no substance use disorder that spend \$8.5 ($sd= 30.8$) and \$14.1 ($sd= 58.3$), respectively. There was also a significant interaction effect on social support, $F(7,1733.2)= 3.3, p<.00$, and observed psychotic behavior, $F(7,1632.1)= 2.2, p=.04$, showing participants with a substance use disorder had less social support after 15 months and greater psychotic behavior after 12 months.

Discussion

The current observational study aimed to address the question of whether among chronically homeless adults with diverse health problems, all of whom would have eventual access to permanent supported housing, those who receive Residential Treatment First (RTF) before obtaining independent housing achieve better psychosocial outcomes than those who immediately receive Independent Housing First (IHF). It should be stated that this was not a test of residential/transitional treatment, but a study that utilized existing data. Participants were grouped based on whether they had spent 2 weeks or more in transitional or residential housing at the time of entry into the program. The results generally did not support the study hypothesis. Although both the RTF and IHF group showed improvements in various psychosocial domains over time, clients in the IHF group were clearly housed in their own place more days, despite starting with more days homeless at baseline. The IHF group also had less days incarcerated overall and reported more choice over their treatment services over time. However, it is notable that since this was not a randomized clinical trial, clients in the RTF group showed evidence of slightly more severe problems as baseline, including a higher proportion of participants with substance use disorders (83.5% to 70.5%), similar to what has been found in a previous study (O'Connell, et al., 2009). The RTF group remained more reliant on transitional/residential treatment over time, and as expected, incurred more substance abuse service costs, but there were no differences on days of homelessness.

When analyses were repeated to include only participants with substance use disorders, results were mostly similar. However, it is notable that one difference found was that the RTF group reported greater housing satisfaction. There may have been more treatment-related activities and services in the RTF group leading to greater satisfaction, suggesting the possibility there may be some benefit with the increased cost incurred by the RTF. Overall, it was found that participants with a substance use disorder were comparatively worse at baseline than participants without a substance use disorder on a range of variables, including homelessness and psychotic behavior. When these baseline differences were controlled for, it was found that participants with a substance use disorder continued to persist in many of these problems over time, including incurring relatively high healthcare costs.

Taken together, these results suggest that clients with substance use disorders do experience more problems living independently, but prior transitional/residential treatment may not particularly benefit them any more than Housing First approaches, especially on independent housing outcomes. A further interpretation is that clients who use transitional/residential treatment continue to use more transitional/residential treatment over time and these settings may be offering supports not provided in independent housing. However, further study is needed and the precise benefits of transitional/residential treatment remain poorly identified in the literature (Kertesz, et al., 2009). In particular, this study was limited by its observational design because there was no random assignment to the RTF or IHF

groups; and as a result differences between participants at baseline could only be controlled for statistically.

The data suggest a need to evaluate RTF and IHF with random assignment before definite conclusions can be made. There may have been influential unmeasured variables that were not accounted for. Conversely, controlling for covariates in the analyses may have limited accurate portrayal of profiles (e.g., controlling for substance use while examining incarceration). Clients in the RTF group may have had more severe problems, warranting transitional/residential treatment before being placed into independent housing. It can be assumed that clinical staff placed clients in transitional/residential treatment based on some subjective judgment of client's capacity to live independently. Their relative improvements may have occurred before the study; as a possible clue, there were no baseline group differences on substance abuse although there was a higher proportion of substance disorders in the RTF group. Future studies should address these issues with experimental designs.

More study is needed on what are the benefits of transitional/residential treatment. Transitional/residential treatment may offer therapeutic settings where staff and peers are readily available (Tsai, et al., in press), but the immediate and long-term measured effects have not been adequately studied. Moreover, transitional/residential treatment may be viable, temporary options in the midst of rising real estate prices and scarcities in housing supply. Although the results of this study do not favor transitional/residential treatment, the clinical implications are not to disregard all instances when clients may want or need it. Instead, the results suggest that clinicians should not assume transitional/residential treatment prepares clients for more independent living and that there is a pay-off in the long run. This study also highlights a well - known problem among the homeless, which is substance abuse (Koegel & Burnam, 1988; Koegel, Sullivan, Burnam, Morton, & Wenzel, 1999) and reiterates the importance of substance abuse treatment for this population.

The results of this study may have been limited by the time periods examined. Participants were grouped on the basis of whether they had spent more than 2 weeks in transitional/residential treatment. While this, in itself, may not be an adequate dose of such treatment, the RTF sample averaged 47 days of residential treatment, which is a substantial dose. Because this grouping was only based on the 3 months before and after baseline, participants that had significant tenure in transitional/residential treatment before this time may not have been properly identified, reflecting the inevitable trade-off between generalizability and specificity. Results of the study may be more generalizable than others in that this was a multi-site study involving numerous agencies and housing settings. However, that also undoubtedly introduced substantial variations between sites, agencies, and settings and the results may not apply to all housing units. Nonetheless, this observational study found no clinical advantages for clients who had residential treatment or transitional housing prior to entry into community housing, but they incurred higher substance abuse service costs.

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Table 1

Characteristics of Participants at Baseline

	Residential Treatment First (<i>n</i> = 121) ^a	Independent Housing First (<i>n</i> = 570) ^b	Test of Difference (<i>df</i>)	<i>p</i> -value
Demographics				
Age	44.8 (10.1)	46.0 (9.2)	<i>t</i> (689) = 1.3	.18
Gender- male (%)	89 (73.6%)	434 (76.1%)	$\chi^2(2) = 1.1$	.57
Race- White	50 (42.0%)	206 (36.5%)		
Black	53 (44.5%)	288 (51.0%)	$\chi^2(3) = 1.8$	.62
Asian/Indiana/Pacific Islander	7 (20.0%)	28 (5.0%)		
Hispanic	9 (17.3%)	43 (7.6%)		
Education (years)	12.0 (2.7)	11.8 (2.6)	<i>t</i> (689) = -0.8	.45
Marital status- not married (%)	120 (99.2%)	565 (99.1%)	$\chi^2(1) < 0.0$	.96
Veteran (%)	29 (24.0%)	175 (30.7%)	$\chi^2(1) = 2.2$	.14
Housing^c				
Days in own place	3.5 (10.2)	6.6 (17.8)	<i>t</i> (256.5) = 2.1*	.04
Days in transitional/residential treatment	47.4 (33.6)	0.0 (0.0)	<i>t</i> (220.7) = -13.4***	<.00
Days housed elsewhere ^d	8.2 (18.0)	13.3 (26.2)	<i>t</i> (207.4) = 2.1*	.04
Lifetime homelessness (years)	7.5 (5.4)	8.2 (6.6)	<i>t</i> (203.2) = 1.3	.21
Past year homeless (%)	97 (80.2%)	496 (87.0%)	$\chi^2(1) = 3.9$	.05
Homeless \geq 4 times in past 3 years (%)	100 (82.6%)	380 (66.7%)	$\chi^2(1) = 12.0^{**}$	<.00
Days homeless	28.2 (33.8)	65.5 (33.2)	<i>t</i> (402) = 9.3***	<.00
Days hospitalized	1.2 (4.4)	2.2 (10.3)	<i>t</i> (402) = 0.9	.36

	Residential Treatment First (<i>n</i> = 121) ^a	Independent Housing First (<i>n</i> = 570) ^b	Test of Difference (<i>df</i>)	<i>p</i> -value
Lifetime incarceration (years)	3.1 (5.4)	2.8 (5.4)	<i>t</i> (661) = -0.4	.66
Days incarcerated	1.2 (5.4)	1.8 (10.3)	<i>t</i> (402) = 0.6	.58
Community Adjustment				
Integrated community activities	6.9 (2.6)	6.8 (2.9)	<i>t</i> (188.0) = -0.4	.72
Social support	1.5 (1.2)	1.4 (1.2)	<i>t</i> (689) = -1.3	.18
Subjective quality of life	4.4 (1.7)	4.3 (1.6)	<i>t</i> (689) = 0.6	.54
Consumer choice	3.9 (1.0)	4.1 (0.7)	<i>t</i> (45.4) = 1.1	.26
Housing satisfaction	4.1 (0.5)	4.1 (0.5)	<i>t</i> (198) = 0.5	.65
Therapeutic alliance	4.6 (1.1)	4.7 (1.1)	<i>t</i> (371) = 0.5	.63
Employment and Income				
Longest full-time job (years)	5.0 (6.4)	5.0 (5.3)	<i>t</i> (674) = -0.1	.95
Employed in past month (%)	24 (19.8%)	90 (15.8%)	$\chi^2(1) = 1.2$	.28
Hours worked per week in past month	3.0 (7.9)	2.8 (8.3)	<i>t</i> (689) = -0.2	.82
Employment income in past month	46.4 (166.9)	43.0 (161.3)	<i>t</i> (689) = -0.2	.84
Public support income in past month	307.3 (324.7)	326.1 (319.1)	<i>t</i> (689) = 0.6	.56
Disability				
Mental health				
Schizophrenia (%)	22 (18.2%)	106 (18.6%)		
Depression (%)	34 (28.1%)	164 (28.8%)		
Bipolar Disorder (%)	28 (23.1%)	102 (17.9%)		
Post-Traumatic Stress Disorder (%)	10 (8.3%)	39 (6.8%)		
Personality Disorder (%)	0 (0.0%)	4 (0.7%)		
			$\chi^2(6) = 5.1$	.53

	Residential Treatment First (<i>n</i> = 121) ^a	Independent Housing First (<i>n</i> = 570) ^b	Test of Difference (<i>df</i>)	<i>p</i> -value
Other (%)	4 (3.3%)	11 (1.9%)		
None/Missing (%)	23 (19.0%)	144 (25.3%)		
Substance abuse				
Alcohol abuse/dependence (%)	76 (62.8%)	287 (50.4%)	$\chi(1)^2 = 6.2^*$	.01
Drug abuse/dependence (%)	74 (61.2%)	289 (50.7%)	$\chi(1)^2 = 4.4^*$	.04
Physical health (%)	84 (70.0%)	365 (64.0%)	$\chi(1)^2 = 1.6$	.21
Developmental disability (%)	11 (9.1%)	58 (10.2%)	$\chi(1)^2 = 0.2$	.70
Health Status				
SF12- Physical health subscale	44.0 (10.1)	45.3 (10.2)	$t(689) = 1.2$	.22
SF12- Mental health subscale	38.1 (8.0)	39.1 (8.2)	$t(689) = 1.3$	.20
Brief Symptom Inventory	1.7 (0.9)	1.5 (0.9)	$t(689) = -2.8^{**}$	.01
Observed psychotic behavior rating	0.2 (0.3)	0.2 (0.3)	$t(689) = -0.4$	.69
Days intoxicated in past month	2.9 (6.8)	1.9 (5.3)	$t(152.4) = -1.5$	.15
Any drug use in past month (%)	44 (36.4%)	229 (40.2%)	$\chi(1)^2 = 0.6$	.44
Mean ASI Alcohol score	0.1 (0.2)	0.1 (0.2)	$t(158.2) = -0.9$	.36
Mean ASI Drug score	0.1 (0.1)	0.1 (0.1)	$t(158.6) = -1.0$	.32
Alcohol expenditures in past month (\$)	14.3 (45.2)	24.9 (57.4)	$t(179.2) = 1.8$	.07
Drug expenditures in past month (\$)	31.6 (125.6)	17.3 (55.5)	$t(99.1) = 1.0$	.30
Health Service Costs				
Medical service costs (\$)	2877.3 (7877.6)	3409.3 (15502.5)	$t(689) = 1.4$	.16
Mental health service costs (\$)	3318.0 (8204.7)	2171.1 (7879.5)	$t(689) = -2.1^*$	.04

	Residential Treatment First (<i>n</i> = 121) ^a	Independent Housing First (<i>n</i> = 570) ^b	Test of Difference (<i>df</i>)	<i>p</i> -value
Substance abuse service costs (\$)	2174.9 (4007.9)	1004.4 (4029.4)	<i>t</i> (161.9) = -4.8***	<.00
Total health service costs (\$)	8370.2 (13101.9)	6584.8 (18103.4)	<i>t</i> (689) = -3.1***	<.00

^aTotal sample size for the Group Housing First group was 131, but 10 participants were not assessed at baseline

^bTotal sample size for the Independent Housing First group was 578, but 8 participants were not assessed at baseline

^cAll outcomes are based on past 3 months, unless otherwise stated.

^dDays housed at somebody else's place, or hotel/single room occupancy/board and care home

* $p < .05$,

** $p < .01$,

*** $p < .001$

Table 2

Summary of Outcomes (unadjusted means)

	Group	3 month	6 month	9 month	12 month	15 month	18 month	21 month	24 month	Main group effect $F =$	Interaction effect (group*time) $F =$
N	IHF ^a	530-560 ^b	525-578	501-568	473-559	434-551	399-520	375-486	342-461	12.3***	0.9
	RTF	128-131	102-113	93-109	90-105	84-101	77-99	71-92	66-88		
Housing^c											
Days in own place ^d	IHF	69.2 (28.1)	80.2 (23.0)	80.9 (23.0)	80.5 (23.1)	78.9 (25.6)	74.9 (30.1)	76.6 (29.3)	75.7 (30.1)	12.3***	0.9
	RTF	47.6 (36.5)	69.4 (34.1)	73.2 (29.7)	72.2 (31.3)	63.4 (35.8)	67.5 (35.2)	65.5 (36.9)	69.7 (34.9)		
Days in transitional/residential treatment	IHF	0.1 (1.2)	2.0 (11.2)	1.8 (10.5)	1.9 (10.4)	2.2 (11.0)	3.8 (16.1)	2.1 (11.0)	3.5 (15.8)	31.5***	12.7***
	RTF	27.8 (33.3)	8.5 (21.8)	4.5 (17.1)	3.9 (13.8)	5.0 (15.1)	6.1 (20.8)	4.1 (17.9)	1.6 (1.4)		
Days Housed Elsewhere	IHF	3.6 (13.5)	2.5 (10.9)	2.5 (11.5)	2.7 (11.3)	3.9 (14.8)	3.4 (14.2)	3.8 (14.7)	4.7 (15.5)	0.3	1.3
	RTF	4.6 (15.0)	5.5 (17.6)	3.6 (10.9)	7.2 (19.4)	10.0 (24.7)	9.0 (22.8)	9.6 (24.4)	10.1 (25.3)		
Days Hospitalized	IHF	1.3 (7.3)	1.4 (7.0)	1.4 (7.2)	1.6 (8.3)	1.5 (8.2)	1.8 (9.8)	1.1 (6.3)	1.1 (7.8)	1.7	0.9
	RTF	1.4 (6.9)	1.4 (7.2)	1.9 (10.3)	2.4 (11.4)	3.0 (12.2)	2.2 (12.2)	2.9 (14.0)	1.4 (7.7)		
Days Incarcerated	IHF	0.8 (5.9)	0.8 (4.8)	1.0 (6.1)	0.9 (6.0)	0.5 (3.3)	1.4 (9.1)	1.2 (8.2)	0.8 (5.5)	5.0*	3.1**
	RTF	0.9 (6.3)	1.3 (7.5)	1.6 (9.5)	0.1 (0.6)	3.5 (13.6)	0.2 (1.6)	3.0 (11.0)	2.7 (11.0)		
Days Homeless	IHF	14.1 (23.9)	3.2 (13.3)	2.2 (11.7)	2.1 (10.9)	2.6 (12.9)	4.3 (17.5)	4.7 (18.1)	3.3 (15.3)	0.0	1.1
	RTF	7.8 (17.6)	3.4 (14.4)	3.6 (15.0)	4.1 (15.3)	4.5 (14.1)	4.6 (16.4)	3.8 (12.4)	4.8 (15.1)		
Community											
Integrated Community Activities	IHF	7.0 (2.8)	7.2 (2.9)	7.2 (2.9)	7.3 (3.0)	7.2 (3.1)	7.5 (3.0)	7.4 (3.0)	7.3 (3.0)	0.3	1.3
	RTF	7.4 (3.1)	7.4 (3.2)	7.3 (3.0)	7.3 (2.8)	7.3 (3.0)	7.1 (3.2)	7.1 (3.1)	7.9 (3.0)		

	Group	3 month	6 month	9 month	12 month	15 month	18 month	21 month	24 month	Main group effect $F =$	Interaction effect (group*time) $F =$
		530-560 ^b	525-578	501-568	473-559	434-551	399-520	375-486	342-461		
N	IHF ^a	128-131	102-113	93-109	90-105	84-101	77-99	71-92	66-88	0.0	1.0
	RTF	1.3 (1.0)	1.3 (1.0)	1.3 (1.0)	1.3 (1.0)	1.3 (1.0)	1.4 (1.1)	1.3 (1.1)	1.3 (1.1)		
Social Support	IHF	1.5 (1.2)	1.5 (1.2)	1.5 (1.1)	1.3 (1.0)	1.4 (1.0)	1.4 (0.9)	1.4 (1.1)	1.4 (1.2)	0.1	0.7
	RTF	4.6 (1.4)	4.6 (1.5)	4.6 (1.5)	4.6 (1.5)	4.7 (1.5)	4.7 (1.4)	4.7 (1.3)	4.7 (1.4)		
Subjective Quality of Life	IHF	4.5 (1.4)	4.5 (1.4)	4.7 (1.5)	4.6 (1.4)	4.5 (1.6)	4.8 (1.4)	4.7 (1.3)	4.7 (1.6)	5.3*	1.9
	RTF	4.1 (0.7)	4.1 (0.8)	4.0 (0.8)	4.1 (0.8)	4.1 (0.8)	4.1 (0.8)	4.1 (0.8)	4.0 (0.8)		
Consumer Choice	IHF	3.8 (1.0)	3.9 (0.9)	3.9 (0.9)	3.9 (0.9)	3.9 (0.9)	3.9 (0.9)	3.9 (0.9)	3.9 (0.9)	1.3	0.3
	RTF	4.1 (0.5)	4.0 (0.5)	4.0 (0.6)	4.0 (0.6)	4.0 (0.6)	4.0 (0.6)	4.0 (0.6)	4.0 (0.6)		
Housing Satisfaction	IHF	4.1 (0.5)	4.1 (0.5)	4.1 (0.5)	4.1 (0.5)	4.0 (0.6)	4.1 (0.6)	4.1 (0.7)	4.0 (0.6)	1.2	1.4
	RTF	4.5 (1.3)	4.5 (1.3)	4.5 (1.3)	4.5 (1.3)	4.5 (1.3)	4.4 (1.3)	4.3 (1.3)	4.2 (1.3)		
Therapeutic Alliance	IHF	4.5 (1.3)	4.4 (1.5)	4.5 (1.2)	4.5 (1.4)	4.4 (1.3)	4.5 (1.2)	4.6 (1.1)	4.6 (1.3)	3.2	0.9
	RTF	2.4 (7.5)	2.5 (8.2)	2.8 (8.4)	2.2 (7.5)	2.5 (8.3)	1.9 (6.9)	1.9 (7.0)	2.4 (8.1)		
Income	IHF	2.8 (7.9)	2.6 (7.9)	2.4 (7.2)	1.6 (5.9)	0.9 (4.1)	2.2 (7.9)	0.8 (4.5)	1.8 (6.1)	0.9	0.6
	RTF	54.1 (238.1)	45.6 (171.8)	56.5 (209.3)	43.4 (179.1)	61.1 (255.6)	42.8 (207.9)	43.3 (219.8)	51.1 (208.7)		
Hours worked per week	IHF	74.4 (270.5)	52.9 (194.4)	64.8 (215.8)	27.1 (130.6)	16.6 (66.9)	37.4 (158.7)	17.5 (76.2)	25.4 (91.9)	0.9	0.6
	RTF	372.7 (333.0)	401.6 (375.6)	408.1 (369.2)	394.5 (375.4)	387.1 (400.4)	415.7 (525.2)	427.3 (737.2)	385.0 (402.1)		
Employment Income	IHF	369.6 (331.4)	365.7 (339.1)	386.6 (350.7)	372.5 (366.6)	398.6 (388.0)	396.9 (399.6)	398.1 (420.0)	411.1 (406.4)	0.2	0.5
	RTF										
Public Support Income	IHF									0.2	0.5
	RTF										
Health	IHF									0.2	0.5
	RTF										

Group	3 month	6 month	9 month	12 month	15 month	18 month	21 month	24 month	Main group effect $F =$	Interaction effect (group*time) $F =$	
											530-560 ^b	525-578	501-568	473-559	434-551	399-520	375-486	342-461
Brief Symptom Inventory	RTF	128-131	102-113	93-109	90-105	84-101	77-99	71-92	66-88	0.9	1.3
	IHF	1.4 (0.9)	1.3 (0.9)	1.3 (0.9)	1.2 (0.9)	1.2 (0.9)	1.2 (0.9)	1.2 (0.9)	1.2 (0.9)		
Observed Psychotic Behavior rating	RTF	1.5 (0.9)	1.5 (0.9)	1.4 (0.8)	1.5 (0.9)	1.5 (1.0)	1.5 (0.9)	1.4 (0.9)	1.4 (0.9)	0.6	0.3
	IHF	0.2 (0.3)	0.2 (0.3)	0.2 (0.3)	0.2 (0.3)	0.2 (0.3)	0.3 (0.3)	0.2 (0.3)	0.2 (0.3)		
SF12 ^c -Medical subscale	RTF	45.2 (10.4)	44.9 (10.2)	44.4 (10.3)	44.7 (9.9)	44.1 (10.3)	43.8 (10.0)	43.5 (9.8)	42.9 (10.1)	0.2	1.3
	IHF	44.7 (10.4)	44.8 (10.6)	45.4 (10.3)	44.5 (10.9)	44.7 (10.7)	43.4 (10.1)	42.1 (10.3)	43.7 (9.7)		
SF12 ^c -Mental subscale	RTF	39.9 (8.6)	40.2 (8.0)	40.5 (8.1)	40.5 (8.4)	41.3 (8.2)	41.1 (7.3)	40.6 (8.0)	41.0 (7.7)	2.8	1.3
	IHF	40.2 (8.1)	39.6 (9.2)	40.9 (8.4)	39.5 (8.4)	39.3 (8.2)	40.8 (8.2)	40.0 (7.6)	39.8 (7.2)		
ASif-Alcohol	RTF	0.1 (0.2)	0.1 (0.2)	0.1 (0.2)	0.1 (0.2)	0.1 (0.2)	0.1 (0.2)	0.1 (0.2)	0.1 (0.2)	1.9	1.1
	IHF	0.1 (0.1)	0.0 (0.1)	0.0 (0.1)	0.1 (0.1)	0.0 (0.1)	0.0 (0.1)	0.0 (0.1)	0.0 (0.1)		
ASI-Drugs	RTF	0.0 (0.1)	0.1 (0.1)	0.0 (0.1)	0.1 (0.1)	0.0 (0.1)	0.1 (0.1)	0.1 (0.1)	0.1 (0.1)	0.7	1.2
	IHF	0.0 (0.1)	0.0 (0.1)	0.0 (0.1)	0.1 (0.1)	0.0 (0.1)	0.0 (0.1)	0.0 (0.1)	0.0 (0.1)		
Costs											
Medical Service Costs	RTF	2757.6 (13144.3)	1850.4 (8691.5)	1698.6 (9659.5)	1419.2 (8528.6)	1585.2 (10566.9)	1357.3 (10586.6)	1219.8 (8738.0)	1340.8 (10014.0)	0.7	0.8
	IHF	4498.2 (393.0)	6760.8 (636.0)	6084.4 (582.8)	6586.5 (642.8)	7529.2 (749.2)	17827.0 (1791.7)	14862.7 (1549.5)	6394.0 (681.6)		
Mental Health Service Costs	RTF	1617.9 (6314.1)	1153.8 (4152.8)	953.3 (3740.9)	1006.3 (5168.0)	941.0 (5412.8)	665.7 (3186.0)	729.7 (3277.3)	408.9 (3049.7)	0.0	1.3
	IHF	2816.5 (7456.2)	2685.1 (10966.1)	647.1 (1838.5)	946.0 (4539.8)	1805.4 (7168.2)	1880.4 (11380.5)	660.1 (2313.3)	778.6 (2623.7)		
Substance abuse Service Costs	RTF	260.5 (1158.6)	300.1 (1703.9)	427.5 (2213.7)	459.1 (3110.6)	474.3 (2720.7)	705.9 (4350.7)	529.7 (3316.9)	582.8 (3737.9)	5-8*	1.2
	IHF										

N	Group	3 month	6 month	9 month	12 month	15 month	18 month	21 month	24 month	Main group effect $F =$	Interaction effect (group*time) $F =$
	IHF ^a	530-560 ^b	525-578	501-568	473-559	434-551	399-520	375-486	342-461		
	RTF	128-131	102-113	93-109	90-105	84-101	77-99	71-92	66-88		
	RTF	1452.9 (4587.1)	614.3 (2076.9)	1104.7 (4864.2)	1327.7 (4930.9)	1850.0 (5728.2)	1438.6 (5400.8)	508.8 (1813.6)	359.8 (1302.7)		
	IHF	4636.0 (15142.4)	3304.2 (9871.8)	3079.3 (10725.2)	2884.5 (10691.6)	3000.4 (12320.7)	2728.8 (12725.9)	2479.2 (9971.6)	2332.5 (11343.5)		
	RTF	5555.8 (11587.5)	5465.6 (14714.7)	3170.4 (8519.8)	5001.3 (13158.4)	6335.1 (23086.1)	3192.3 (15246.5)	2233.6 (7441.4)	4384.1 (13631.4)	0.2	0.7

^a IHF= Independent Housing First, RTF= Group Housing First

^b Sample sizes for measures of choice, satisfaction, and therapeutic alliance were considerably less because clients had to identify primary providers or be in their own place at time of assessment. For these measures, samples sizes ranged from 188-347 for the IHF group and 41-100 for the RTF group.

^c All outcome values are based on the last 3 months, except income which is only based on last month.

^d All outcome values are shown as mean (standard deviation).

^e SF12= Medical Outcomes Study Short Form, scores range from 0 to 100 with 50 representing normal functioning.

^f ASI= Addiction Severity Index, scores range from 0 to 1 with higher scores reflecting greater substance abuse.

* $p < .05$,

** $p < .01$,

*** $p < .001$