

A review of research on residential programs for people with severe mental illness and co-occurring substance use disorders

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Abstract

*Substance use disorder is the most common and clinically significant co-morbidity among clients with severe mental illnesses, associated with poor treatment response, homelessness and other adverse outcomes. Residential programs for clients with dual disorders integrate mental health treatment, substance abuse interventions, housing and other supports. Ten controlled studies suggest that greater levels of integration of substance abuse and mental health services are more effective than less integration. Because the research is limited by methodological problems, further research is needed to establish the effectiveness of residential programs, to characterize important program elements, to establish methods to improve engagement into and retention in residential programs and to clarify which clients benefit from this type of service. [Brunette MF, Mueser KT, Drake RE. A review of research on residential programs for people with severe mental illness and co-occurring substance use disorders. *Drug Alcohol Rev* 2004;23:471–481]*

Key words: mental illness, substance abuse, residential treatment, co-occurring disorders

Introduction

Substance use disorder is the most common and clinically significant co-morbidity among clients with severe mental illnesses. Because dual disorders are associated strongly with unstable housing and homelessness, residential programs have emerged as a popular intervention strategy. In this paper we review and discuss the evidence for the effectiveness of residential dual-disorders programs. We use the term ‘residential programs’ rather than ‘residential treatment’ because much of the treatment in these programs occurs outside of the residence. We use ‘substance abuse’ interchangeably with ‘substance use disorder’ to refer to abuse or dependence on alcohol or other psychoactive drugs. ‘Severe mental illness’ refers to major mental illnesses, such as schizophrenia, bipolar disorder and severe depression, when they are accompanied by prolonged disability. ‘Dual diagnosis’ or ‘dual disorders’ denote the co-occurrence, or co-morbidity, of severe mental illness and substance use disorder.

The problem of dual diagnosis was identified by clinicians in the late 1970s and early 1980s (e.g. [1,2]). Research has since clarified that dual disorders are common, with lifetime substance abuse affecting approximately 50% of individuals with schizophrenia and other severe mental disorders [3]. Co-occurring substance use disorders are associated with a variety of negative outcomes for people with severe mental illness, including higher rates of mental illness relapse [4], hospitalization [5], violence [6], victimization [7], serious infections such as HIV and hepatitis C [8], incarceration [9] and homelessness [10].

Rates of homelessness in people with severe mental illness are high, particularly in urban American settings. Studies of clinical groups of clients served in urban and suburban public mental health clinics over 1–2 years report rates of homelessness between 15% and 40% [11–13]. Rates in Australia are similarly high [14]. Much lower rates of homelessness have been reported in the rural United States [15], Britain [16,17] and Norway [18].

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The strong relationship between co-occurring substance abuse and homelessness has been found in the prevalence studies cited above as well as many other studies [19–22]. The relationship appears to be stronger in men with schizophrenia than in women [19,23], in people with co-occurring drug use disorders compared to those with alcohol use disorders [10,15,21,22,24], in those with less family support compared to those with more family support [10] and in people with more severe psychiatric symptoms compared to those with lower levels of symptoms [24]. People with dual disorders become homeless following loss of family support, absences due to institutionalization in hospitals and jails, and financial or money management problems—all of which can be due to substance abuse.

Treatment for people with dual disorders in parallel and separate mental health and substance abuse treatment systems is remarkably ineffective. Parallel treatment results in fragmentation of services, non-adherence to interventions, dropout from treatment and service extrusions, because treatment programs remain focused rigidly on single disorders and clients are unable to negotiate the separate systems and to make sense of disparate messages regarding treatment and recovery [25,26].

To address poor outcomes and problems with parallel treatment, most treatment innovations for this population in the United States and around the world have involved combining mental health and substance abuse treatments and tailoring them for people with co-occurrence, a clinical process that is often termed ‘integrated dual-disorders treatment’. Because co-occurring substance use disorders often lead to homelessness, integrated treatment of the mental illnesses and substance use disorders in relation to residential programs developed at the same time. Residential programs address the need for housing as well as the need to develop other skills, supports and activities necessary for recovery [27].

Although residential programs are recommended frequently for people with dual disorders, and an increasing number of such programs are becoming available, their effectiveness remains uncertain. To address the issue of effectiveness, we reviewed controlled studies of residential programs for people with dual disorders. This review is limited to controlled studies for several reasons. Findings from uncontrolled, descriptive studies (i.e. open clinical trials or pre–post investigations) are often not replicated in controlled studies. Controlled studies (experimental and quasi-experimental) are more robust and the field is now mature enough, in terms of the number of available controlled studies, to impose this minimal standard of design quality. We identified studies for review by searching several

computerized databases: MEDLINE, PsycLIT, Cochrane Library and Project CORK. We also tried to identify unpublished reports through the National Institute of Mental Health, the National Institutes of Alcoholism and Alcohol Abuse, the National Institute of Drug Abuse, the Substance Abuse and Mental Health Services Administration and state Departments of Health and Human Services.

Studies of residential dual-disorder programs

Our search identified 10 controlled studies of residential interventions, which are summarized in Table 1. Three studies were designed as randomized experiments, but two of them (Sacks *et al.* [33] and Nuttbrock *et al.* [34]) were analyzed and interpreted as quasi-experimental due to methodological issues discussed below. The remaining studies were designed as quasi-experimental studies. The planned length of residential programs in these studies varied from 1 month to several years. All but one of the residential program studies were designed to test the hypothesis that a more integrated program would be more effective than a non-integrated or less integrated program.

We have categorized the recent studies as short-term (average stay 6 months or less) or long-term (average stay longer than 6 months), because longer length of participation may be associated with better outcomes. Additionally, we note whether programs identify themselves as therapeutic communities. Therapeutic communities have long been a standard residential program approach for people with primary substance use disorders [28]. They are characterized by ‘community as method’, whereby the community has an identity, rules, and clear expectations for members’ behavior. Therapeutic communities utilize the strong presence of 12-Step programs, such as Alcoholics Anonymous groups, as well as peer support and governance, and are known for confrontational approaches [29]. Many of the studies of residential services for people with dual disorders utilize a therapeutic community model, modified to allow for the integration of mental health into the substance abuse program setting, as one or both of the interventions.

The type of integrated treatment programs varies considerably across studies, and two studies [30,31] combined outcomes from a large number of residential programs with varying characteristics. In addition, a variety of outcome domains were studied, such as substance abuse, psychiatric symptoms, housing, hospitalization and arrests, with inconsistent domains and measures across the studies. Furthermore, many of the studies have serious methodological limitations. The experimental studies reported problems with poor

engagement and heavy attrition, often by self-selection [32], significant subject cross-over between interventions [33] or skewed entry to the programs due to differences in waiting periods or administrative requirements between programs [34]. The studies also were limited by non-equivalence of groups, small sample sizes, high rates of dropout, non-representative clients, non-specific interventions and treatment drift. Despite these shortcomings, our review suggests support for integrated residential dual-disorders programs, and identifies critical research issues that need to be addressed in future research.

Short-term residential programs

Five studies examined short-term (6 months or less) residential programs [30–32,35,36]. Aguilera *et al.* [35] compared clients in Honduras who received 3 months of treatment in an integrated mental health and substance abuse program with those who received treatment in a substance abuse treatment program. The integrated approach was associated with higher rates of program completion, but substance use outcomes were not different between the groups. Using a similar design, Anderson [36] reported a study of 225 dually disordered homeless men, 154 of whom had a psychotic disorder. The study compared outcomes of clients enrolled in a lower demand, integrated dual-disorder program with a mental health rehabilitation focus to outcomes of clients enrolled in a higher demand, traditional therapeutic community program, both of which were 6-month, hospital-based residential programs in New York City which utilized Alcoholics Anonymous (AA). Clients in the integrated rehabilitation program were more likely to stay in treatment (74.5% vs. 34.8%), to enter community programs and housing at discharge, and to avoid substance abuse relapse.

Burnam and colleagues [32] conducted a trial of 3 months of integrated residential program compared to integrated outpatient treatment and parallel outpatient treatment-as-usual in 276 mainly homeless dual-disorder clients, 40% of whom had a psychotic disorder. Both treatments were intensive, including rehabilitation, medication and AA, but the residential program was located far from the clients' original urban neighbourhood and was less flexible. Only 60% of the clients assigned to the programs attended even once, indicating poor ability to engage clients and the majority of those dropped out, although the residential program retained significantly more clients for 3 months than the outpatient program (24% vs. 8%). All three groups improved in measures of substance use, symptoms and housing status. Improvements at 3 months were associated with participating in the study programs

as well as use of AA. Improvements in substance abuse at 6- and 9-month follow-ups were associated with use of AA.

Two large studies of short-term residential programs from the Veteran's Administration suggest that various parameters of integration result in better outcomes for dually disordered male veterans. Moggi and colleagues [30] evaluated 981 men with dual diagnoses, 142 of whom were diagnosed with a psychotic disorder, who attended 15 different 30-day residential substance abuse programs. Evaluations occurred at intake, discharge and at 1-year follow-up. The programs were based on either a 12-Step model, a cognitive-behavioral treatment (CBT) model or a mixed 12-Step/CBT model. Programs that scored above the mean on participant ratings for 'support', 'involvement', 'task orientation' and 'organization' were classified as having a 'good dual-diagnosis treatment climate'. Dual-diagnosis clients attending the eight programs with good dual-diagnosis treatment climates reported higher levels of coping and higher rates of abstinence than clients attending the seven comparison programs. Abstinence was most highly correlated with post-discharge out-patient treatment and with 12-Step program participation, such as with AA, during the year after discharge. The researchers did not evaluate outcomes for clients with psychotic disorders separately in this report, but in another analysis of the same data outcomes for clients with severe mental illnesses were the same as those with milder mental illnesses [37].

Kaspro and colleagues [31] studied 71 short-term residential programs who contracted with the Veteran's administration to serve 1495 dually diagnosed veterans, 255 of whom had diagnoses of psychotic disorders. This study compared outcomes at discharge for clients in programs self-identified as primary substance abuse programs to outcomes for clients in programs self-identified as dual-disorders programs. Most of the substance abuse programs used a 12-Step self-help model, whereas the dual-disorders programs used a variety of models, including self-help (28%), psychosocial rehabilitation (34%) or therapeutic community (19%). Although participants rated primary substance abuse programs as involving higher levels of expressed anger and aggression, staff control, staff involvement and problem orientation than dual-disorders programs, the dually diagnosed clients with psychotic disorders experienced the same, albeit low, rates of 'successful discharges' from both types of programs (about 35%). Additionally, clinicians rated most clients' levels of alcohol or drug problems as improved at discharge. Those with psychotic disorders in the dual-disorders programs were more likely to be discharged to housing and less likely to be discharged to institutions.

Table 1. Controlled trials of residential programs for people with severe mental illness and co-occurring substance use disorders

Author	Design	Participants	Interventions	Retention	Housing	Substance abuse outcomes	Other
Blankertz & Cnaan [38]	Quasi-experiment. Outcomes 3 months after discharge	<i>n</i> = 89 homeless men and women with dual disorders in Philadelphia, 70% with psychotic disorders	1 year residential psychosocial rehabilitation with integrated addiction treatment vs. two modified therapeutic communities	81% vs. 53% at 2 months		Abstinence 43% vs. 16% in clients in the residential rehabilitation vs. the therapeutic communities	
DeLeon <i>et al.</i> [40]	Quasi-experiment. Outcomes 1 year and approximately 2 years after baseline	<i>n</i> = 342 homeless men and women with dual disorders in Brooklyn NY	1 year low demand vs. high demand therapeutic communities vs. treatment as usual	56% vs. 34% at 1 year		Less frequent alcohol and drug use in the low demand therapeutic community compared with high demand and treatment as usual at 2 years after baseline	Less crime, less HIV risk, and more employment in the low demand program
Nuttbrok <i>et al.</i> [34]	Experiment. Outcomes 12 months post baseline, in residence	<i>n</i> = 694 homeless dual disorder clients in South Bronx NY	Two low demand community residences with mental health orientation vs. high demand modified therapeutic community for 1 year	88% vs. 73% at 2 months, 37% vs. 25% at 1 year		No differences in substance abuse outcomes	More mental health improvements in the high demand modified therapeutic community
Brunette <i>et al.</i> [39]	Quasi-experiment. Outcomes 6 months after discharge	<i>n</i> = 84 men and women with dual diagnoses in New Hampshire	Flexible, long-term integrated residential treatment (average 400 days) vs. short-term integrated residential treatment (average 66 days)	73% vs. 39% at 3 months	7% vs. 23% homeless	38% vs. 8% abstinence in the long-term vs. the short-term integrated program	
Sacks <i>et al.</i> [33]	Quasi-experiment. Outcomes 12 months after release from prison	<i>n</i> = 185 incarcerated dual diagnosis clients	1 year integrated mental health and substance abuse treatment unit vs. modified therapeutic community while incarcerated.			No difference in substance use-related crime	Less reincarceration (9% vs. 33%) for post-discharge therapeutic community attenders

(continued overleaf)

Table 1. (continued)

Author	Design	Participants	Interventions	Retention	Housing	Substance abuse outcomes	Other
Sacks <i>et al.</i> [33] contd.			Optional 6 months additional modified therapeutic community after release for those in prison therapeutic community			No difference in substance use-related crime	Less reincarceration (9% vs. 33%) for post-discharge therapeutic community attenders
Aguilera [35]	Quasi-experiment. Outcomes 1 month after discharge	<i>n</i> = 86 men with dual disorders, 28 with psychotic disorders in Honduras	3-month low demand residential treatment with integrated mental health and substance abuse interventions vs. higher demand residential treatment with substance abuse focus	82.7% vs. 93.7% at 3 months		No difference in substance abuse improvements. Low functioning clients did better in low demand program	
Anderson [36]	Quasi-experiment. Outcomes at discharge and 3 months post-discharge	<i>n</i> = 225 homeless men with dual disorders discharged from Bellevue hospital in New York City	3–6-month residential treatment with integrated mental health and addiction vs. highly structured therapeutic community	74.5% vs. 34.8% at 3 months	44.7% vs. 9.7% in community housing 3 months post-discharge	Recidivism due to substance abuse relapse 11.8% vs. 36.9% in the integrated program vs. the therapeutic community at 3 months post-discharge	
Burnam <i>et al.</i> [32]	Experiment. Outcomes at 3, 6, and 9 months post-baseline	<i>n</i> = 276 homeless dual disorder clients, 40% with psychotic disorders in Los Angeles	Residential integrated mental health and substance abuse treatment for 3 months vs. integrated outpatient program vs. parallel treatment as usual	24% vs. 8% at 3 months	No differences	No differences in substance use outcomes at 6 and 9 months post-baseline between integrated residential, comparison, and parallel treatment as usual	

(continued overleaf)

Table 1. (continued)

Author	Design	Participants	Interventions	Retention	Housing	Substance abuse outcomes	Other
Kaspro <i>et al.</i> [31]	Quasi-experiment. Outcomes at discharge for men with psychotic disorders	<i>n</i> = 1495 men with dual disorders; 255 with psychotic disorders	71 90-day residential facilities self-identified as dual disorder treatment vs. facilities self-identified as primary substance abuse treatment	37.8% vs. 32.8% at 3 months	31.1% vs. 22.9% housed at discharge	No difference in substance abuse improvements	Less employment at discharge (29.0 vs. 39.3%)
Moggi <i>et al.</i> [30]	Quasi-experiment. Outcomes at 1 year post-discharge	<i>n</i> = 981 dually diagnosed men, 142 with psychotic disorders	15 30-day residential treatment programs. Eight programs scoring above the mean on support, involvement, task orientation were designated 'good dual diagnosis treatment climate'			Dual diagnosis climate associated with improved substance coping and abstinence at 1 year	

Long-term residential programs

Five studies examined long-term (1 year or more) residential programs [33,34,38–40]. Blankertz & Cnaan [38] compared a low-demand integrated residential dual-disorder program to two modified therapeutic communities. Of the 135 dually diagnosed homeless individuals who entered and left the programs during the study period, only 89 (65.9%) stayed more than 2 months. Clients in the low-demand program were more likely to remain for 2 months or more (81% vs. 53%) and to experience ‘successful discharges’. At 3 months post-discharge, 29% in the low-demand integrated program were abstinent, housed and without hospitalization, whereas only 7.9% in the therapeutic community residences achieved these outcomes. Abstinence rates were also better for the low demand program: 43% vs. 16%.

Nuttbrock and colleagues [34] studied 694 homeless dual-disorder clients who were assigned randomly to low-demand community residences or to a modified therapeutic community, both with integrated mental health and substance abuse interventions, for 1 year. All the residences rejected many of the clients referred to them, and another third of the clients never showed up to enter. Although the community residences retained more clients who started (37% vs. 25%), no significant differences in substance abuse outcomes were reported during the year in treatment.

DeLeon and colleagues [40] studied 342 homeless men and women with dual disorders in Brooklyn, New York, who were assigned to a high-demand therapeutic community, a low-demand therapeutic community, both of which were modified to include mental health treatment or to an out-patient treatment as usual. The low-demand therapeutic community was designed to provide more flexibility, more freedom and more direct assistance, as well as less structure and responsibility than the high-demand therapeutic community. The low-demand therapeutic community was associated with better treatment retention at 1 year (56% vs. 34%), better outcomes at 1- and 2-year follow-ups (less substance abuse, less criminal activity, lower levels of HIV risk behavior and higher rates of employment) than the higher demand program. Assignment to either of the modified therapeutic communities was associated with better outcomes than assignment to treatment-as-usual.

Sacks *et al.* [33] studied incarcerated dual-diagnosis clients who participated in either an integrated mental health and addiction program or a modified therapeutic community for 1 year while incarcerated, and found no differences in re-incarceration or substance-related crime 1 year after release from prison. They also compared outcomes for clients who elected to participate in 6 months of a modified therapeutic community

after release with clients who received treatment as usual after release. One year after release from incarceration, the clients who participated in the post-release residential program had less reincarceration, less criminal activity and less alcohol or drug-related criminal activity than those who did not.

Brunette and colleagues [39] compared a short-term integrated residential program (expected length of stay 3 months) with a long-term integrated residential program (unlimited length of stay). In addition to longer residence, the long-term program was more flexible, was integrated into an urban community setting, was closely affiliated with a community mental health center and utilized graduated, carefully planned discharges into the community. Clients in the long-term program were more likely to remain in treatment 3 months after discharge. At 6 months post-discharge, the clients in the long-term program were more likely to be abstinent (38%) compared to those in the short-term program (8%) and were less likely to have experienced homelessness (7% vs. 23%).

Discussion

Residential interventions for people with co-occurring disorders are of great interest for a variety of reasons. We know at this point that a substantial portion of clients with co-occurring disorders, perhaps 50% or more, do not respond well to integrated out-patient services [41]. Non-response may be due, in part, to lack of structure and supports in the community [42]. One key support that is missing for many of these clients is stable, safe and supportive living arrangements [43]. Many dual-disorder clients are homeless, live in marginal situations where they have little control of their surroundings or live in housing projects or neighborhoods that are pervasively affected by drug abuse [44]. Additionally, peer support for recovery, a widely recognized need for clients seeking to reduce substance use, can be difficult to find. Another challenge for some clients who wish to reduce substance use may be a lack of internal controls and refusal skills to resist cravings and social pressures to use substances. This group may benefit from the support of external controls, such as limits on drug purveyors and drug use in residential settings. Finally, accessing services and maintaining a connection to treatment is a challenge for many of these clients. Residential programs potentially offer all of these benefits in one coherent package that removes people from their substance-abusing environment and provides a supportive place to learn the skills conducive to living a sober and rewarding life.

Despite clinical enthusiasm and the promise of initial studies, this field is only beginning to develop clinical guidelines and data on outcomes. A number of clinical

issues need to be clarified by further research. First and foremost is the question of effectiveness. Nine of 10 studies suggest advantages for integrated residential programs that were modified to meet the needs of SMI clients, although each of these studies has major methodological difficulties (see Introduction). Thus, further research is needed to establish the effectiveness of residential treatment. The field desperately needs a randomized controlled trial with a well-defined population, a standardized program and blind assessment of outcomes. Even one small, tightly controlled study under effectiveness conditions (routine clients, clinicians and programs) would be a tremendous step forward. Careful attention to engagement and retention of clients into treatment, which will be discussed below, will be necessary to achieve a successful trial.

Secondly, research needs to clarify who benefits from residential programs and at what point in the recovery process. Because residential programs are expensive compared to out-patient programs, it makes little sense to refer clients who would respond to less intensive services. Additionally, some clients may need something different from residential programs [45] and many clients prefer to live independently [46]. However, because the care of dual-disorder clients who are frequently homeless, hospitalized or incarcerated is also very expensive, and because they do so poorly these clients may be good candidates for residential treatment. Moreover, a cost analysis of the De Leon study [47] showed that the more effective residential treatment cost about the same as out-patient parallel treatment, mainly because the clients in outpatient treatment used more than twice as many hospital days and eight times as many emergency room visits as the clients in the residential program.

However, currently we know little about which clients respond to residential programs. Studies have included different groups: e.g. people who have not been able to engage in or benefit from out-patient treatment, people who are homeless and those just released from prison or from hospitals. Besides homelessness, however, the personal characteristics of dually diagnosed people who need residential programs are uncertain. What little research that has been conducted to establish client factors predicting treatment retention has not been able to establish predictors [34,38], except one study, which showed that clients in the earlier stages of treatment (with lower levels of motivation) were more likely to drop out of the program due to substance use [48]. Are people in need of residential programs those who have more severe illnesses, who have weaker community supports, or who have greater cognitive difficulties?

Thirdly, the specific components and structures of dual-disorder residential programs vary tremendously and we know little about which are most effective.

Integrated mental health and substance abuse interventions are clearly part of successful residential programs. Greater levels of integration seem to be associated with better engagement and retention in treatment [31,34–36,38,49]. Another feature that appears to be important is a modification of the traditional confrontational approach of therapeutic communities to a more supportive, less intensive approach [31,34–36,38,39,49]. Moggi and colleagues [30] showed that programs rated by participants as being high in ‘support’, ‘involvement’ and ‘task orientation’ were associated with better outcomes, but the authors did not clarify how these characteristics translated into program components. Sacks and colleagues [50] described specific modifications over the different stages of recovery, with a focus on slower, more concrete substance abuse counseling, more flexibility in treatment, fewer participant responsibilities for community governance, and more staff support and guidance.

Other specific features of residential programs are not clear. Is one specific model, e.g. 12-Step vs. cognitive–behavioral, more effective? How much time should be spent on teaching social, vocational and living skills, as opposed to skills for managing substance abuse and mental illness? Should rehabilitation services be provided primarily on site or more in natural settings, such as might be provided by supported education and supported employment? What about rules and limits on substance abuse? Should people be discharged for substance abuse inside the residence, outside the residence, or not at all?

Fourthly, how should people be engaged in residential programs? When programs have rigid entry criteria and rules for abstinence [34], their ability to engage and retain clients into treatment is poor. Non-rigid boundaries, which allow clients to enter gradually over time, such as through visiting at dinnertime, attending a few meetings at the program, or getting to know a counsellor before admission and before attaining abstinence, may permit much higher rates of engagement and also engagement of clients at different levels of recovery [39]. Attention to engagement and retention are vital not only to developing more effective programs but also to completing a successful study of residential programs. Further research needs to clarify the impact of more flexibility with entry and abstinence rules on the milieu and programming. Additionally, what techniques facilitate engagement to residential programs? Are outreach, motivational interviewing, or contingency management helpful?

Fifthly, optimal length of stay is also unclear. In general, clients who remain in programs longer or who complete programs have better outcomes [30,34,38,39,49]. Two of three studies of 1-year residential programs showed better substance abuse

outcomes for the integrated interventions [38,49], whereas only one of the four studies of short-term programs [36] showed improved substance abuse outcomes. Additionally, Brunette and colleagues [39] showed better retention, substance abuse outcomes and housing outcomes for clients who participated in a long-term integrated program compared to those who participated in a short-term integrated program.

Programmatic flexibility to respond to individual differences is probably even more important than length of stay. Some clients may need only brief support, while others need lengthy support, and still others need many years of structure and support. Perhaps the key issue related to when discharge is appropriate is some level of engagement in community-based activities. Clients who are working, who have established a network of non-substance abusing friends and who are well linked with treatment and/or self-help in the community are probably more ready to transfer to independent living, but research to support this concept does not yet exist.

Finally, the process of discharge needs further study. In general, clients who complete residential programs have better outcomes [38,39,49], although this finding could be due to self-selection, with clients who are able to maintain abstinence staying in the program, or to a tautology, as clients who relapse are extruded and therefore do not complete programs. Moreover, it is not clear that discharge from residential programs is really the goal. Some programs consider the residential program to be permanent housing and many clients stay for years, experiencing sobriety and expansion of recovery into other life domains while in the residence, because they find that the program meets their long-term needs for structure and support. Another possibility is that discharge, like engagement, needs to be considered a semi-permeable boundary. That is, many people may do better with a gradual discharge and the option to return to the residential program if they are doing poorly [39].

Ultimately, a continuum of housing supports are necessary to serve people with dual disorders at different stages of treatment [51]. 'Wet' housing, which tolerates substance use, should be available to provide shelter and safety to clients in the early stages of treatment who have low motivation to stop using substances and who need a stable base from which to be able to engage in treatment [52]. 'Damp' housing imposes some limits on substance use, which facilitates early efforts to cut down for clients who are developing some motivation to change. 'Dry' housing, which is intolerant of substance use on the premises, provides support for ongoing sobriety. Residential integrated dual-disorder treatment is necessarily in 'dry' housing, but housing needs can be addressed with a variety of other strategies, including supported housing pro-

grams, which can provide support and treatment within an apartment building setting after discharge from residential programs [53], or with individualized assertive community treatment strategies [52,54] to engage clients into community-based integrated dual-disorder treatment.

Summary

Substance abuse is a common and devastating clinical co-morbidity among people with severe mental illness. Recent research offers evidence that residential dual-diagnosis programs that integrate and modify mental health and substance abuse treatment approaches can be effective for dual-disorder clients who are homeless or treatment non-responders. In addition to integration of mental health and substance abuse interventions, research suggests that residential programs should be flexible, supportive, low-intensity and offered for long periods of time. Further research is needed to establish the effectiveness of residential approaches, to characterize which clients benefit, and to establish methods to better engage and retain clients in these programs.

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