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Family Intervention for Co-occurring Substance Use and Severe Psychiatric Disorders: Participant Characteristics and Correlates of Initial Engagement and More Extended Exposure in a Randomized Controlled Trial

Kim T. Mueser^{1,2,3}, Shirley M. Glynn^{4,5}, Corrine Cather^{6,7}, Roberto Zarate^{5,8}, Lindy Fox^{1,3}, James Feldman^{7,9}, Rosemarie Wolfe^{1,3}, and Robin E. Clark¹⁰

¹ Department of Psychiatry, Dartmouth Medical School, Hanover, NH

² Department of Community and Family Medicine, Dartmouth Medical School

³ Dartmouth Psychiatric Research Center, Concord, NH

⁴ VA Greater Los Angeles Healthcare System at West Los Angeles, CA

⁵ Department of Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, CA

⁶ Schizophrenia Program of the Massachusetts General Hospital, Boston, MA

⁷ Harvard Medical School, Boston, MA

⁸ Pacific Clinics, Los Angeles, CA

⁹ Massachusetts Mental Health Center, Boston, MA

¹⁰ Center for Health Policy and Research, University of Massachusetts Medical School

Abstract

Clients with severe mental illness and substance use disorder (i.e., dual disorders) frequently have contact with family members, who may provide valuable emotional and material support, but have limited skills and knowledge to promote recovery. Furthermore, high levels of family conflict and stress are related to higher rates of relapse. The present study was a two-site randomized controlled trial comparing a comprehensive, behaviorally-based family intervention for dual disorders program (FIDD) to a shorter-term family psychoeducational program (FPE). The modal family was a single male son in his early 30s diagnosed with both alcohol and drug problems and a schizophrenia-spectrum disorder participating with his middle-aged mother, with whom he lived. Initial engagement rates following consent to participate in the study and the family intervention programs were moderately high for both programs (88% and 84%, respectively), but rates of longer term retention and exposure to the core elements of each treatment model were lower (61% and 55%, respectively). Characteristics of the *relatives* were the strongest predictors of successful initial engagement in the family programs with the most important predictor being relatives who report *higher* levels of benefit related to the relationship with the client. Subsequent successful exposure to the family treatment model was more strongly associated with *client* factors, including less severity of drug abuse and male client gender. The results suggest that attention to issues of

Address correspondence to: Kim T. Mueser, Ph.D., Dartmouth Psychiatric Research Center, Main Building, 105 Pleasant St., Concord, NH 03301, Tel. (603) 271-5747, FAX (603) 271-5265, Email: kim.t.mueser@dartmouth.edu.

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motivating relatives to participate in family intervention, and more focused efforts to address the disruptive effects of drug abuse on the family could improve rates of engagement and retention in family programs for dual disorders.

People with severe mental illnesses (SMI) such as schizophrenia and bipolar disorder have a high prevalence of co-occurring substance use disorders or dual disorders (Mueser et al., 2000; Regier et al., 1990). Clients with dual disorders have a worse course of psychiatric illness than persons with SMI alone, including more frequent relapses and rehospitalizations, homelessness, poor health, legal problems, and increased depression, hopelessness, and suicide (Drake, O'Neal, & Wallach, 2008; Kavanagh et al., 2004). While progress has been made on development and validation of integrated treatment models for co-occurring disorders in this population (Drake et al., 2008; Kavanagh & Mueser, 2007), the results from different controlled studies are inconsistent and improvements are often modest at best (Cleary, Hunt, Matheson, Siegfried, & Walter, 2008). There is a need to improve the effectiveness of treatments for dual disorders.

One potentially fruitful area of intervention may be with the family. People with dual disorders often have contact with their relatives (Clark, 1996), who provide significant amounts of psychological and material support (Clark, 2001). However, dual disorders can have deleterious effects on relatives by increasing their burden of care and leading to interpersonal conflict (Dixon, McNary, & Lehman, 1995; Kashner et al., 1991; Salyers & Mueser, 2001; Sciacca & Hatfield, 1995). Family members are more likely to hold a relative with a dual disorder responsible for his or her psychiatric symptoms than relatives with only SMI (Niv, Lopez, Glynn, & Mueser, 2007), while tense and stressful family relationships may contribute to more frequent relapses (Pourmand, Kavanagh, & Vaughan, 2005). The net result of this strain on the family can be the loss of family support, leading to housing instability, homeless (Caton et al., 1995; Caton, Shrout, Eagle, Opler, & Felix, 1994), and a more severe course of both disorders.

Family intervention has been repeatedly shown to be effective for persons with SMI (McFarlane, Dixon, Lukens, & Lucksted, 2003; Pitschel-Walz, Leucht, Bäuml, Kissling, & Engel, 2001), and it is widely accepted as an evidence-based practice for this population (Dixon et al., 2001). Similarly, ample support documents the efficacy of family-based treatment for substance use disorders (O'Farrell & Fals-Stewart, 2006; Stanton & Shadish, 1997). However, little attention has been paid to working with families of people with dual disorders.

To our knowledge, the only previously reported attempt to develop and evaluate a family intervention program for dual disorders was by Barrowclough and colleagues (2001). Their program combined individual-based motivational interviewing and cognitive-behavioral therapy for psychosis with family intervention. The family intervention aimed to educate the family about the nature of dual disorders and support reduction in substance use and abstinence. Substance abuse outcomes at the nine-month post-treatment assessment favored the combined intervention program over usual services (Barrowclough et al., 2001), although at the 18-month follow-up the advantage of combined treatment was no longer significant (Haddock et al., 2003). However, the sample size in this study was small (N=36), thereby reducing power to detect significant treatment effects. In addition, the combination of individual treatment with family intervention in this study raises the question of what benefits could accrue from just providing family treatment without specialized individual treatment for dual disorders.

To address this question we developed and pilot tested the Family Intervention for Dual Disorders (FIDD) program (Mueser & Fox, 2002). The program was adapted from the

behavioral family therapy model for SMI (Falloon, Boyd, & McGill, 1984; Mueser & Glynn, 1999) to provide psychoeducation about dual disorders, communication skills training to reduce stress within the family, and family problem solving training to resolve conflicts and enhance client motivation for substance use reduction and abstinence (Mueser, Noordsy, Drake, & Fox, 2003). This article describes the characteristics of persons who entered a recently completed randomized trial comparing the FIDD program to a briefer psychoeducational program (FPE). In addition, we explored the rates and predictors of family engagement and exposure in the two interventions after the client and key relative had provided informed consent to participate in the study and family programs. The results of this trial will be reported elsewhere. However, retention is a critical issue in substance abuse treatment (Drake, Mueser, Brunette, & McHugo, 2004). Understanding the overall acceptability and feasibility of implementing these two approaches to family intervention for dual disorders, and exploring client and family characteristics related to engagement and exposure to the interventions, is a critical aspect of determining their overall utility.

Method

A randomized controlled trial was conducted at three sites, two in Boston and one in the Los Angeles area. As the same clinicians and research staff treated and evaluated clients in the two Boston sites, data from them were combined into a single site for the purposes of describing baseline differences between sites and predicting engagement and exposure to the family programs. Recruitment for the study began in February, 2002 and ended in June, 2006. All of the study procedures were approved of by the appropriate university and hospital Institutional Review Boards.

Study Sites

The study took place at the Pacific Clinics Community Mental Health Center in Sante Fe Springs, close to Los Angeles in California, the North Suffolk Mental Health Association in Boston, and the Massachusetts Mental Health Center in Boston. All three agencies predominantly serve persons with SMI living in urban areas and offer a comprehensive range of mental health services (see below).

Participants

Inclusion criteria for participation in the study were: a) minimum 18 years old; b) psychiatric diagnosis of schizophrenia, schizoaffective disorder, or bipolar disorder, based on the Structured Clinical Interview for DSM-IV(SCID) (First, Spitzer, Gibbon, & Williams, 1996); c) diagnosis of active substance abuse or dependence within the past 6 months, based on the SCID; d) at least 4 hours per week contact with relative, close friend, or other person (e.g., member of clergy) with a caring but non-professional relationship with the client (hereafter referred to as “relatives”); e) client currently receiving services at one of the three mental health agencies participating in the study; and f) willingness of the client and a family member (or equivalent) to provide written informed consent to participate in the family program to which they are assigned and the assessments. While it was clear this was a program addressing the problem of persons with SMI and co-occurring substance abuse, participants did *not* have to indicate a desire to stop substance or alcohol use to enroll in the study.

A total of 750 families were screened for the study, of whom 196 clients were potentially eligible and approached for consent, and of whom 125 of their relatives were approached for consent. Seventy-four clients indicated they did not want family intervention, 6 relatives of clients who consented to family intervention declined to participate, and in 2 families both the client and relative together indicated they did not want family intervention. A total of

108 families (clients and key relative) consented to participate in the study, completed the baseline assessments, and were randomized to one of the two family intervention programs. An additional 9 families signed consent for the program but either did not meet eligibility criteria or did not complete the baseline assessment, and 3 clients provided consent but their key relative could not be contacted. Thus, out of 196 clients approached to participate in the study, 76 declined, for a refusal rate of 39 percent. Out of 125 relatives approached to participate, 8 declined, for a refusal rate of 6 percent.

The demographic, diagnostic, and clinical characteristics of the two study groups are provided in Table 1 (clients) and Table 2 (relatives).

Measures

Assessments were conducted by trained interviewers who were blind to treatment assignment at baseline, and 1-, 2-, and 3-years post-randomization. The present report focuses on a subset of these measures at baseline, including client and family background information, psychiatric functioning and quality of life, substance abuse, family functioning, and recent hospitalizations for psychiatric or substance use problems. In addition several questions were added midway through the study regarding the process of recruiting and assessing clients and relatives for the study.

Prior to assessing study clients interviewers were trained on the instruments using live and taped interviews. Monthly calls were conducted with the interviewers to review ratings and discuss assessment questions. Over the course of the study interviews were randomly selected and rated by a third interviewer to check on reliability.

Background information—In addition to demographics about the client and relative, other information obtained included the nature of the kinship, living situation (together or not), and the number of hours per week of contact.

Psychiatric functioning and quality of life—Symptom severity was assessed with the expanded version of the Brief Psychiatric Rating Scale (BPRS) (Lukoff, Nuechterlein, & Ventura, 1986), a widely used measure including 24 items rated on 7-point anchored Likert scales. The four-factor solution for the BPRS (Velligan et al., 2005) was used to compute factor scores for the statistical analyses, which includes: psychosis, depression, activation, and retardation. Quality of life was evaluated with the overall life satisfaction item on the Quality of Life Interview (Lehman, Kernan, & Postrado, 1995), which is a self-report rating provided on a 7-point Likert scale ranging from 1 (terrible) to 7 (delighted).

Substance abuse—The SCID was used to determine current substance use diagnoses. Days of excessive alcohol use and days of drug use over the past 6 months were assessed with the Time-line Follow-back Calendar (TLFBC) (Sobell & Sobell, 1992), adapted for people with SMI (Mueser et al., 2003) and shown to be reliable in this population (Carey, Carey, Maisto, & Henson, 2004). Ratings of alcohol and drug use severity over the past 6 months were made by either the case manager or another clinician using all sources of clinic data (e.g. interviews with clinic staff, reviews of medical records, etc) on the revised versions of the Alcohol Use Scale (AUS) and Drug Use Scale (DUS) (Mueser et al., 1995; Mueser et al., 2003). These measures, which have been shown to be reliable and valid in persons with SMI (Mueser et al., 1995), summarize the severity of substance use during the worst one-month period over the past six months in a 5-point scale corresponding to DSM-IV criteria for substance use disorders: 1 = no use, 2 = use without impairment, 3 = abuse, 4 = dependence, and 5 = severe dependence with institutionalization (e.g., substance dependence resulting in hospitalizations or incarcerations).

Parts of the Addiction Severity Index were employed (McLellan et al., 1992). For this paper, the interviewer global ratings of alcohol and drug use severity were used, as well as the client's perceived need for additional treatment for alcohol and (separately) drug abuse. Ratings were made on 5-point Likert scales, with lower scores corresponding to less severity and less need for treatment. In addition, two questions (yes/no) from the supervision module of the Family Experiences Interview Schedule (FEIS) (Tessler & Gamache, 1996) were asked to evaluate whether the key relative had actively attempted to prevent the client from using alcohol or drugs over the past month.

Family functioning—Selected subscales from the FEIS (Tessler & Gamache, 1996) were employed to evaluate the effects on the relative of having a close relationship with someone who has a SMI. The FEIS is a semi-structured interview designed to capture both perceptions of burden and gratification related to this close relationship. The number of missing items was too great to compute Cronbach's alphas for three subscales, including objective burden related to activities of daily living, subjective burden related to activities of daily living, and disruption of daily routine, and thus these subscales were dropped from the analyses. The FEIS subscales used (and their corresponding Cronbach alpha values) included: benefits of the relationship (.72), gratification (.88), financial involvement in different areas of the client's life (.60), and stigma about mental illness (.82). For each subscale, higher scores reflect a worse family experience (e.g., less gratification, more burden and stigma).

Distress in the key relative was assessed with the Brief Symptom Inventory (BSI) (Derogatis, 1993). The BSI is a widely used 53-item questionnaire in which the respondent rates the severity of distress related to different symptoms experienced over the past 30 days on a 5-point Likert scale ranging from 0 (no distress) to 4 (extreme distress). For statistical analyses, the average score across all items was used. Cronbach's alpha in this sample was .97.

Relationship distress between the key relative and the client was assessed with the Family Attitude Scale (FAS) (Kavanagh et al., 1997), completed separately by the relative and client. The FAS includes 30 items pertaining to how the individual feels about his/her relative (e.g., "I feel very frustrated with him"), with each item rated on a 5-point Likert scale ranging from 1 (every day) to 5 (never) and higher scores reflecting more negative feelings about the person. The FAS has been shown to be reliable and valid in families of people with SMI, with scores significantly related to the Camberwell Family Interview measure of expressed emotion (Vaughn & Leff, 1976), and predictive of symptom relapse (Kavanagh et al., 2008). In this sample, Cronbach's alpha for the relative version was .96 and for the client version was .95.

Two questions were also included from the ASI to evaluate the key relative's use of substances over the past 30 days. The number of days over the past month that the relative used alcohol to get drunk or drank more than three drinks in a day was assessed, as was the number of days the relative used drugs. Because of the low rates of self-reported substance use, the responses to each of these questions were collapsed into a binary (yes/no) variable.

Recruiter and interviewer ratings—After becoming aware of difficulties recruiting, assessing, and involving families in the study and treatment programs, several additional questions were added to measure potentially important characteristics of the recruitment and assessment process. The person who recruited the family completed two 5-point Likert scale ratings regarding the client's or relative's cooperation during the recruitment process (compared to other family members previously recruited), with scores ranging from 1 ("among the easiest I have recruited") to 5 ("among the most difficult I have recruited").

The recruiter also recorded the number of missed or cancelled appointment for the client and relative during recruitment. The interviewer completed similar cooperation ratings for the client and relative for the assessment process, and recorded the number of missed or cancelled appointments for each. Finally, the interviewer provided two ratings on 5-point Likert scales about their impression as to whether the client or relative would complete the family program, ranging from 1 (completely certain he/she will finish) to 5 (unlikely he/she will finish).

Family program contacts—Following each contact with the family or individual relatives related to provision of one of the family programs, the therapist completed a contact sheet. These contact sheets indicated the purpose, time, location, and duration of the contact. In addition, for protocol sessions with family members based on one of the family program models, the therapist indicated the focus and content of the session, including specific curriculum or skills that were taught.

Family Programs

All clients in the study continued to receive the usual array of clinical services they had been receiving prior to their participation. Across all three agencies these services included pharmacological treatment, case management, day treatment, vocational rehabilitation, and referrals to substance abuse treatment with each agency. Family intervention was not provided on a systematic basis at any of the agencies, although multiple family psychoeducation groups were offered (but rarely utilized by study participants) at the Los Angeles site. In addition to continuing to receive usual services, families were randomized to participate in either the short-term Family Psychoeducation (FPE) program (6–8 weekly sessions) or the Family Intervention for Dual Disorders (FIDD) program (9–18 months).

Clinicians

All clinicians had advanced training in clinical psychology, saw at least three trainee cases prior to taking on a study case, were supervised in weekly in person sessions by master trainers, and saw families in both conditions. In Boston, the clinicians were Caucasian, while in Los Angeles they were Latino and African American.

Family Psychoeducation (FPE) Program

The FPE program was based on the assumption that families with a member with a dual disorder would benefit from learning basic information about the disorders and their treatment in order to make informed treatment decisions and to access desired services within their mental health agency or their broader community. The FPE program was provided over 6–8 weekly one-hour sessions, with all involved family members, including the client, at a location convenient for the family (e.g., home, clinic). Teaching was conducted using basic psychoeducational principles such as asking questions to elicit the family's expertise and experience, providing information in small manageable chunks, using multiple methods to convey information (e.g., didactic presentation, handouts), and home assignments for family members to review the most recent session's topic (Mueser & Glynn, 1999). Topics included Basic Facts about the Psychiatric Disorder (different handouts for schizophrenia, schizoaffective disorder and bipolar disorder), Medications (separate handouts for antipsychotics, mood stabilizers, and antidepressants), the Stress-Vulnerability Model of Psychiatric Disorders, the Role of the Family, Facts About Alcohol and Drugs, Motives and Consequences of Substance Use, Treatment of Dual Disorders, and (for clients with a history of injection or intranasal drug use) Infectious Diseases. Treatment was coordinated with the client's primary treatment providers at the agency with the goal of strengthening the family's ability to work effectively with the treatment team.

Family Intervention for Dual Disorders (FIDD) Program

The FIDD program was based on an expanded conceptualization of the *stress-vulnerability model* of SMI, and was informed by the concept of the *stages of treatment for co-occurring disorders*, based on the *stages of change*.

Expanded stress-vulnerability model—This model posits that SMIs are caused by a psychobiological vulnerability determined by genetic and other biological factors, and that the course of the disorders (e.g., symptoms, relapses, functioning) is influenced by the dynamic interplay between psychobiology, stress (e.g., life events, exposure to high levels of interpersonal conflict), the social environment (e.g., social support), and client coping skills (e.g., social skills, stress management skills) (Mueser & Glynn, 1999; Nuechterlein & Dawson, 1984; Zubin & Spring, 1977). According to this model, the course of SMI can be improved by reducing biological vulnerability through psychotropic medications and minimizing alcohol or drug use, reducing socioenvironmental stress, improving social support, and improving client coping skills.

The FIDD program was designed to address the goals that follow from the stress-vulnerability model through a combination of three strategies, including 1) providing psychoeducation about dual disorders and their treatment to facilitate medication adherence, reduce substance use, and improve social support; 2) teaching communication and problem solving skills to reduce family stress, improve coping, and facilitate all family members' achieving personal goals; and 3) tailoring those skills to the unique needs of each family. These strategies were addressed primarily in single family sessions. During the later part of their participation in the protocol, families were also encouraged to attend booster multiple family groups, which provided opportunities for social support and group problem-solving.

Stages of treatment—The transtheoretical stages of change model (DiClemente & Prochaska, 1998; Prochaska, 1984) proposes that when people alter potentially unhealthy behaviors they proceed through a sequence of distinct motivational states. In this project, the stages of change model was adapted for the stages of treatment model of dual disorders (Mueser et al., 2003; Osher & Kofoed, 1989), which describes the stages that people go through when getting professional-based treatment for a dual disorder. Four different stages were identified, each characterized by a unique pattern of behavior with an explicit goal for that stage. During *engagement*, the client does not have a therapeutic relationship with the clinician, and the clinician's goal is to establish such a relationship through regular contacts. During *persuasion* a therapeutic relationship has been established, but the client continues to abuse substances unabated with no clear desire to reduce, and hence the clinician's goal is to instill motivation for change, as indicated by reduction in substance use or abstinence. During *active treatment* the client has made progress towards reducing substance use or achieving abstinence, and the clinician's goal is to eliminate the client's harmful use of substances. During *relapse prevention* harmful use of substances has been eliminated and the clinician's goal is to help the client prevent relapses. The stages of treatment concept was developed to help clinicians optimize their therapeutic interventions by ensuring that they are consistent with each client's motivational stage of change.

The stages of treatment concept was used to inform the organization and pacing of the FIDD program, primarily the single family session component. These sessions focused initially on establishing a therapeutic relationship with the family, followed by providing information (and other motivational enhancement strategies, if necessary) designed to motivate them to work on the client's substance abuse. When some evidence of motivation to reduce was apparent, attention shifted to further reduction and abstinence, followed by helping the family develop relapse prevention strategies when harmful use had ceased.

Single family sessions—The protocol called for family sessions to include the client and any involved family members. Sessions lasted for about an hour, were conducted at a location convenient for the family (e.g., home or clinic), and were to be provided on a declining contact basis (e.g., weekly, biweekly, monthly) for a minimum of 9 months and a maximum of 18 months. Sessions were organized in a series of phases, including *connecting, assessment, psychoeducation (same topics and sequence as the FPE program), problem-solving training, and termination*. In order to facilitate teaching problem solving skills to families with strong, negative interactive patterns, *communication skills training* was provided as an optional phase. Communication and problem solving training were conducted using social learning methods such as role plays, in session practice, and home practice assignments. The number of sessions spent on each phase was flexible, with all aspects of the program individualized to address the unique needs of each family; most families were encouraged to attend for at least one year. The specific phases of the family sessions were tailored to the client's stage of treatment. For example, the FIDD connecting and assessment phases corresponded to the engagement stage of dual disorder treatment.

Multiple-Family Group (MFG) Sessions

Relatives and clients were invited to attend multiple-family groups when they had completed the psychoeducation phase of the single-family session component, or earlier if interest in reducing substance use was evident. These groups were conducted on a monthly basis by two leaders, following the format of other psychoeducational support groups for persons with SMI (Schooler et al., 1997), adapted for people with dual disorders (Mueser et al., 2003). Meetings began with a brief caring and sharing period, followed by a 20–30 minute presentation on an educational topic. This presentation segued into a group discussion among the members which included questions and answers, sharing of personal experiences, describing coping strategies, and general group support. Toward the end of the group the leaders conducted a wrap-up and reviewed possible topics for the next group.

Meetings lasted 1–1.5 hours, were held in the evening, and included 3–7 families. Refreshments were served. Reminder letters were sent out and group leaders followed up with families who missed a group. During the first several months of a new group the leaders assumed responsibility for presenting the educational topic in order to develop group cohesion. Following this, outside speakers were sometimes invited to present on selected topics. Family members were invited to participate in the multiple-family groups for up to two years following enrollment in the project and assignment to FIDD.

Although the multiple-family groups were conceived as a core component of the FIDD program, and a pilot study had found good attendance at these groups (Mueser & Fox, 2002), attendance rates at these monthly groups were low in both Boston and Los Angeles, typically running below 50 percent of invited families. Efforts to increase attendance at the groups through individual outreach to families, identifying convenient times and locations, and providing refreshments appeared to have little effect. Because of low attendance, the program in Los Angeles stopped offering these groups in March of 2005, and in Boston the groups stopped in February of 2005.

Definitions of Engagement and Exposure to Family Programs

For both FIDD and FPE, we defined *engagement* as the therapist and family attending at least two protocol sessions including both the key relative and the client. We conceptualized exposure to the family program as successful completion of the core defining components of each program. For FPE, where the major goal was to provide basic information about dual disorders and their treatment to empower families to make informed decisions about their relative, exposure was defined as completion of at least six sessions. For FIDD, where the

primary goal is to teach problem solving to the family, exposure was defined as completion of at least three problem solving training sessions. Note that the FIDD program delivered as planned would be substantially longer than the FPE program (20–30 sessions over 9–18 months vs. 6–8 sessions delivered over 2–3 months). Thus, while number of FIDD sessions was flexible, meeting the exposure in the FIDD program typically required attendance at more sessions than the FPE program; potential participants were aware of the different treatment lengths when they entered the program.

Procedure

Referrals for the study were made by treatment providers at the lead agencies, based on a brochure that described the project and regular visits to treatment teams by research staff. Once a referral was made, a member of the research team usually met with the client, reviewed the study, and if the client was interested, obtained informed consent. The client then identified a key relative, who was contacted by a member of the research team to arrange a meeting, explain the study, and obtain informed consent if the relative was interested in participating. Occasionally the study was described to the client and relative in a single meeting, where consent was also obtained. All relatives who were potential participants in the family programs were invited to this meeting, although informed consent was obtained from only one key relative, usually the person with the most contact with the client. When informed consent had been obtained from the client and key relative, the baseline interview with the client was scheduled to confirm eligibility for the study. If the client completed the interview and was eligible, the baseline interview with the relative was scheduled. Clients and relatives were compensated for completing assessment interviews but not for participating in the family programs.

Upon completion of the relative's baseline interview an offsite project coordinator was contacted, who randomized the family to either the FIDD program or FPE using a computer program. No one was aware of the randomization sequence in advance. Separate randomization sequences were used for each of the three agencies where the study took place, stratified by diagnosis (schizophrenia or schizoaffective vs. bipolar) and whether or not the client was living with the key relative.

Statistical Analysis

We first compared clients assigned to FIDD vs. FPE on all the demographic, clinical, and family functioning characteristics measured at baseline using *t*-tests or χ^2 analyses. Second, we evaluated site differences between Los Angeles and Boston in these same characteristics by performing the same analyses. Third, we examined rates of engagement and exposure to FIDD or FPE during the study, and compared client and relative characteristics between families who were exposed to the FIDD program and those exposed to the FPE, using *t*-tests or χ^2 analyses. Since there were no differences in the rate of engagement or exposure to the two programs, or in any of the family characteristics associated with engagement or exposure to the different programs, families who were exposed or engaged to either program, respectively, were combined for subsequent analyses. Fourth, we performed *t*-tests and χ^2 analyses to compare engaged vs. non-engaged families, and exposed vs. non-exposed families on all the demographic, clinical, and family functioning characteristics measured at baseline. Last, we performed two logistic hierarchical stepwise regression analyses, one predicting engagement to the family program and the other predicting exposure, and including all variables for which the univariate analyses were significant at the $p < .05$ level. The recruiter and interviewer ratings about missed appointments, cooperation, and perceived likelihood that the family would complete the program were not included in these analyses because these ratings were initiated about half way through the project, and therefore data were missing on many families. Because site was significantly related to a variety of

demographic, clinical, and family characteristics, as well as to both engagement and exposure to the family programs, these other variables first entered into the regression equation in a stepwise fashion in the first step, with site then entered into the equation in the second step. This permitted a test of whether site predicted engagement or exposure after statistically controlling for other potentially important site differences in client or family characteristics. Because these analyses were largely exploratory rather than confirmatory in nature, and the data are unique and potentially valuable to the field, we did not control for Type I error related to computing multiple statistical tests.

Results

Comparisons of clients and relatives assigned to FIDD or FPE revealed no statistically significant treatment group differences on any of the variables measured at baseline. Analyses of site differences, on the other hand, indicated significant differences between the clients and relatives enrolled in the project in Los Angeles and Boston. These site differences are summarized in Table 3. Clients in Los Angeles were more likely to be Latino and to be living at home with the key relative than clients in Boston. Clients in Los Angeles also tended to have more severe psychiatric symptoms, drug use disorders, amphetamine use disorder, and rated themselves as having a greater need for treatment of their substance use disorders than clients in Boston. Cocaine and opiate use disorders were more common in the Boston than Los Angeles clients. The relatives of clients in Boston were more likely to report recent alcohol intoxication or drug use than those in Los Angeles, and also indicated lower levels of perceived benefit and greater subjective burden related to the client's activities of daily living.

Based on our a priori definition of engagement in the FIDD and FPE programs (i.e., participation in two or more family sessions), 46 out of 52 (88%) families assigned to FIDD were engaged in the program and completed a mean of 19.59 ($SD = 11.38$) sessions, compared to 47 out of 56 (84%) families assigned to FPE who completed a mean of 6.66 ($SD = 1.72$) sessions. Regarding rates of exposure to the family programs, 32 out of 52 (61%) families in FIDD were exposed to the program (e.g., attended at least 3 problem-solving sessions) and completed a mean of 24.97 ($SD = 9.16$) sessions, whereas 31 out of 56 (55%) families were exposed to FPE (e.g., attended at least 6 educational sessions) and completed a mean of 7.55 ($SD = 1.26$) sessions. Families who were exposed to the FIDD program required an average of 12.56 ($SD = 3.29$) sessions to reach the criterion of 3 problem solving sessions. Among non-engaged families in FIDD, 8 (50%) dropped within the first 6 sessions, with the remaining families receiving between 7 and 14 sessions. For families not engaged FPE, on the other hand, 9 (41%) had dropped out by the third session, and 17 (77%) had dropped out by the fifth session. The rates of engagement and exposure between the FIDD and FPE programs were not statistically significant, nor were any of the differences in client or relative characteristics between families who were exposed to the two programs.

Predictors of Engagement and Exposure

Even though the two treatments differed in planned length, there were no treatment differences in engagement and exposure rates, so they were combined for engagement and exposure analyses respectively. Among the subgroup of families on whom the recruiters and interviewers provided ratings of cooperation and likelihood of completing the family program, only 5 families were not engaged in at least two sessions. Therefore, analyses of engagement were not conducted using these measures. Significant univariate predictors of engagement and exposure to the family program are summarized in Tables 4 and 5. Three variables predicted both engagement and exposure to the family programs: site, the relative's employment status, and whether the client had an amphetamine use disorder.

Families recruited in Boston were more likely to be successfully engaged and exposed to the family program to which they had been assigned than families recruited in Los Angeles. In addition, relatives in families who were employed full-time were more likely to be engaged and exposed to their family program than those who were either working part-time or were unemployed. Finally, families in which the client had an amphetamine use disorder at baseline were less likely to engage in and be exposed to their family program.

Several variables predicted only engagement. Latino families were less likely to engage in their family program than non-Latino families, as were families of clients with more severe alcohol use disorders on the AUS. In addition, the relatives in families who did not engage in their family program reported *greater* perceived benefits of their relationship with the client and *lower* levels of stigma on the FEIS than the relatives of families who were successfully engaged.

Regarding the other predictors of exposure to the family program, female clients were less likely to be exposed than males. Clients who had more days of drug use on the 6-month TLFB were less likely to be exposed to their family program. Similarly, interviewer ratings of both greater drug use severity and client self-ratings for need for drug treatment were both related to lower levels of family exposure to their assigned program. Last, the interviewer's rating that the client was likely to complete the family program was significantly related to a greater likelihood of exposure to the program.

For the logistic regression predicting engagement in the family program, among the six variables related to engagement in the univariate analyses (not including site), only the relative's perceived benefit of his or her relationship with the client (on the FEIS) was a unique predictor (Wald = 6.59, $df = 1$, $p = .01$). When site was forced into the equation after FEIS benefits, it was no longer statistically significant (Wald = 3.49, $df = 1$, $p = .062$), indicating that perceived benefit of the relationship was the more important predictor.

For the logistic regression predicting exposure to the family program, among the six variables related to engagement in the univariate analyses (not including site and the interviewer rating that the client will finish the program), two were unique predictors: days of drug use (Wald = 6.30, $df = 1$, $p = .012$) and male client gender (Wald = 4.28, $df = 1$, $p = .039$). As with the engagement analyses, when site was forced into the equation after the other two significant predictors, it was no longer statistically significant (Wald = 2.41, $df = 1$, $p = .121$).

Discussion

The prevalence of co-occurring substance use disorders is high in people with SMI (Regier et al., 1990; Teeson, Hall, Lynskey, & Degenhardt, 2000), and has a negative impact on family relationships (Dixon et al., 1995; Kashner et al., 1991; Salyers & Mueser, 2001). However, little research has addressed the needs of families who have a member with a co-occurring disorder, despite the established benefits of family programs focusing on severe mental illness alone (Pitschel-Walz et al., 2001) and addiction alone (Stanton & Shadish, 1997). The family intervention for dual disorders (FIDD) program was developed as a comprehensive family intervention (20–30 sessions) for co-occurring disorders (Mueser & Fox, 2002), which combines psychoeducation with training in communication and problem solving skills, both common ingredients in family programs for SMI (Falloon et al., 1984; Mueser & Glynn, 1999) and addiction (O'Farrell & Fals-Stewart, 2006), informed by the concepts of stages of change in addiction (DiClemente & Prochaska, 1998) and stages of treatment for co-occurring disorders (Mueser et al., 2003; Osher & Kofoed, 1989). For the present study, FIDD was compared to a shorter term (6–8 session) family psychoeducation

(FPE) program based on the same educational curriculum but without any formal skills training.

Initial engagement rates (i.e., attending at least two therapy sessions) were moderately high among study participants (88% for FIDD, 84% for FPE), demonstrating that the family clinicians were able to initiate working relationships with most of the families. These high rates of engagement were expected considering that both clients and relatives had consented to participate in the study and family programs. In addition, it should be noted that the analyses of predictors of engagement and exposure to the family programs are constrained in this sample by the prior consent of the families, and that different predictors might emerge in a non-study clinical sample.

Three of the factors that predicted lack of engagement were related to the relatives, including unemployment of the key relative, greater perceived benefit by the relative of his/her relationship with the client, and lower levels of the relative's perceived stigma related to the client's SMI. Families with scheduling constraints due to the relative working were *more* likely to be successfully engaged in treatment, not less likely as might be expected. It is possible that the relative's employment status served as a proxy for some other factor that more directly influenced engagement and exposure to the family program, such as the degree of investment in the client (higher for working relatives), level of social functioning (higher), funds for transportation to sessions (higher), or severity of overall psychosocial stressors (lower). It is also possible that unemployed relatives were more motivated to consent for the study in order to get the money paid for completing the study assessments, without fully intending to participate in the treatment programs themselves.

Interestingly, relatives who perceived greater stigma associated with the client's illness, and who rated their relationship as providing fewer benefits, were more likely to be engaged in the family programs, with the perception of relationship benefits being the only significant predictor in the multiple regression analysis. Overall, these findings suggest that the experiences and attitudes of the key relative to participate in family treatment is a critical determinant of initial treatment engagement. Relatives in families who were successfully engaged were less satisfied with the client and may have had greater expectations of eventually benefiting from the relationship with the client those who were not engaged.

Although relative factors were important, client factors also were predictive of initial engagement. The presence of amphetamine use disorder and more severe alcohol use disorder among clients predicted lower rates of engagement, suggesting that the severity of the client's substance abuse may interfere with the ability of the family to convene for the purposes of treatment or make members feel less hopeful about change, and thus less likely to commit to ongoing treatment. Latino ethnicity was also related to lower levels engagement in treatment, consistent with their lower rates of health and mental health service utilization in the U.S. (Hough et al., 1987; Padgett, Patrick, Burns, & Schlesinger, 1994; Samnaliev, McGovern, Clark, 2009), and lower retention in mental health treatment (Dworkin & Adams, 1987). The ethnic differences between the two sites may also explain the higher rates of engagement of families in Boston compared to Los Angeles. Although ethnicity and site predicted engagement in treatment, neither was a unique predictor in the multiple regression analysis. This finding suggests that Latino relatives and relatives enrolled in Los Angeles may have perceived more benefits in their relationship with the client, as this was the sole unique predictor of not engaging in treatment.

Despite the success in engaging families, the rates of therapeutic exposure of families to core defining components of each family program (i.e., completion of at least six psychoeducation sessions for FPE or three sessions in problem solving training for FIDD)

were considerably lower, 61 and 55 percent, respectively. Among families who were engaged in treatment, the exposure rate for FIDD was 73 percent, compared to 69 percent for FPE. These rates are somewhat lower than Haddock and colleagues (2003) rate of retention of families in their combined program of 72 percent for families, and 83 percent for clients.

The finding that rates of exposure to FIDD and FPE were similar despite different criteria for exposure that required significantly more FIDD sessions is noteworthy. One-half of the families who dropped out of FIDD did so within the first six sessions, compared to all of the families who dropped out of FPE, suggesting that many families may be primed to drop out of any intervention early in its course. These data highlight the critical importance of early work on developing the alliance in family dual disorder treatment. The remaining families who dropped out of FIDD before completing three problem solving sessions received 7–14 sessions. It is possible that the individual meetings clinicians had with each family member before beginning FIDD sustained their involvement longer in the program than FPE, but that despite this a similar proportion of families concluded that the program was not meeting their needs.

A number of different variables predicted exposure to the family programs. The most consistent pattern among the predictors was substance abuse problems, with the number of days of drug use on the timeline follow back calendar, the clinician's rating on the ASI of the clients' drug abuse severity, the client's own self rating of the need for drug use treatment, and the presence of an amphetamine use disorder all associated with a lower rate of exposure to the family programs. Among these variables, the number of days of drug use was one of two unique predictors of exposure in the multiple regression analysis. This suggests that even when families have been successfully engaged in treatment, that drug use problems interfere with conducting the basic family work. The finding that the severity of drug abuse, but not alcohol abuse, is related to exposure to the family treatment programs is consistent with some research suggesting that drug abuse in people with schizophrenia is more strongly associated with disruptive and problematic family relationships than is alcohol use problems (Salyers & Mueser, 2001). In addition, the interviewer's rating of the likelihood that the client would complete the program was another predictor of engagement. This suggests that these problems were evident early on, even before clinical engagement of the family had begun to take place.

Families' employment status and site were also predictive of exposure to the family program, similar to their predictive relationship to engagement in the program. However, neither of these variables was a unique predictor of exposure in the multiple regression analysis, indicating that other predictors were more important.

Gender was a significant and independent predictor of exposure to the family programs in the logistic analysis, with female clients and their relatives less likely to complete the program than men. It is unclear why female clients were less likely to complete the program than men. Dual disorders are much more likely to occur in men than women (Kavanagh et al., 2004; Mueser, Yarnold, & Bellack, 1992; Mueser et al., 1990; Mueser et al., 2000), leading to the possibility that programs targeting individuals with co-occurring disorders, including the programs in the present study, may have been more geared towards the needs of men than women, as well as their respective caregivers, leading to more dropout among female than male participants. Other clinical researchers have called attention to the special needs of women with dual disorders, and the importance of ensuring that treatments are adapted to address those needs (Brunette & Dean, 2002; Brunette & Drake, 1997; Brunette & Drake, 1998).

A host of site differences in client and relative differences were apparent between Los Angeles and Boston. In general substance abuse severity was worse in clients in Los Angeles, including higher rates of drug use, amphetamine use disorder, more severe clinician ratings of drug abuse, and more client need for treatment for drug abuse. However, rates of cocaine and opiate abuse were higher in Boston than Los Angeles, consistent with prior research indicating that the types of substances used in clients with SMI are subject to local market forces (e.g., prices, availability that may vary over time; Kavanagh et al., 2004; Mueser et al., 1992). The results are also consistent with data from the National Survey on Drug Use and Health from 2002 to 2005 (Substance Abuse and Mental Health Services Administration, 2009), which found higher rates of amphetamine use on the west coast of the U.S. and higher rates of cocaine use in the northeast U.S. Clients recruited in Los Angeles were more symptomatic on the BPRS than those recruited in Boston. This difference may have been related to the lower use of mental health services by Latinos (Kouyoumdjian, Zamboanga, & Hansn, 2003), resulting in more impaired Latino clients enrolling in such services compared to non-Latinos. There were also differences between the sites in the key relatives. Relatives enrolled in the study in Los Angeles perceived higher current benefits of their relationship with the client than relatives in Boston, as well as greater perceived stigma; both variables related to lower levels of engagement and treatment in the programs. However, relatives in Boston were more likely to report having gotten intoxicated over the past month than those in Los Angeles. These differences between sites in clinically important variables may account for why site was not predictive of engagement or exposure to the family programs when other important predictors were included in the multiple regression analyses.

Multiple family groups are an evidence-based treatment for families of persons with serious psychiatric illnesses (McFarlane, Link, Dushay, Marchal, & Crilly, 1995; McFarlane et al., 1995), and a few words about our inability to sustain multiple family groups at either site are in order. Groups were poorly attended from their inception, and rarely had more than 3–4 participants at a meeting. As the study progressed, the team increased its effort to improve attendance (e.g., more frequent reminders to families, scheduling more outside speakers, offering more appealing refreshments, setting expectations earlier in the single family treatment for transition to the multiple family groups) to no avail. While we do not have hard data on the issue, informal discussions with family members indicated that most of those who had a preference for meeting and interacting with other family members were already attending groups such as local chapters of the Alliance on Mental Illness when they joined the project, while the others were either too burdened by multiple care giving activities to attend more treatment or judged their needs were being adequately met by the family program.

The significant predictors of engagement in family work and exposure to the family programs suggests several possible avenues for modifying family interventions to make them more appealing to family members and more effective in engaging and retaining them in treatment. Among the predictors of engagement in the family program, factors related to the relatives appear to be more important than those related to the client, with three variables predicting engagement (relatives' employment status, perceived benefits of the relationship, and perceived stigma). This pattern suggests it may be important to attend to developing an alliance with family members early in treatment. Relative impediments or concerns about the treatment should be addressed early, and motivational interviewing (Miller & Rollnick, 2002) used to increase perceived benefits of participating in the program which is often targeted to clients, may benefit relatives as well.

While factors related to the relatives tended to be most strongly predictive of engagement in the family program, exposure to the family programs was more strongly related to client

factors, in particular the severity of the clients' drug abuse. These findings suggest that in order for family treatment to be effective with clients who have severe drug abuse problems, it may be critical to target drug abuse early and more directly than was done in the current programs. For example, developing strategies for families to impose limits setting on a relative with an active drug abuse problem could reduce some of the immediate effects of drug abuse on family functioning, and may facilitate more active participation in the program. Similarly, contingent reinforcement for abstinence from drug use could be explored as another strategy for addressing drug use problems (Sigmon & Higgins, 2006).

Overall, the fact that most participants were exposed to the core features of the respective interventions is noteworthy and suggests participants valued the treatment. However, many participants left treatment prematurely, highlighting the need to continue to refine dual disorder family programs to assure they are acceptable to clients and families

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Table 1

Demographic and Diagnostic Characteristics of Study Clients

Categorical Variables	Psychoeducation (<i>N</i> = 56)		FIDD (<i>N</i> = 52)	
	<i>N</i>	%	<i>N</i>	%
Gender				
Male	41	73	35	67
Female	15	27	17	33
Race/Ethnicity				
Black	5	9	3	6
Caucasian	42	75	34	65
Native Hawaiian/Pacific Islander	1	2	---	---
Native American/Alaska Native	1	2	1	2
Asian	---	---	1	2
More than one race	7	12	13	25
Marital Status				
Never married	32	57	36	69
Ever married	24	43	16	31
Education				
Completed high school	35	62	33	63
Did not complete high school	21	38	19	37
Psychiatric Diagnosis				
Schizophrenia	24	43	27	52
Schizoaffective	15	27	13	25
Bipolar	17	30	12	23
Substance Use Diagnosis				
Alcohol Use Disorder	11	20	8	15
Drug Use Disorder	14	25	19	37
Alcohol and Drug Use Disorder	31	55	25	48
Living Situation				
Independent	21	38	19	37
With relative	35	62	33	63
Site				
LA	31	55	27	52
Boston	25	45	25	48
Continuous Variables	Mean	(SD)	Mean	(SD)
Age	34.45	(11.83)	32.75	(11.01)

Table 2

Characteristics of Key Relatives

Categorical Variables	Psychoeducation (N = 56)		FIDD (N = 52)	
	N	%	N	%
Gender				
Male	14	25	13	25
Female	42	75	39	75
Relationship to Client				
Parent	30	54	28	54
Spouse	7	12	9	17
Sibling	8	14	7	13
Other relative	6	11	5	10
Other	5	9	3	6
Ethnicity				
Black	4	7	4	7
Caucasian	45	80	43	80
Native American/Alaska Native	1	2	1	2
Asian	1	2	1	2
More than one race	5	9	3	9
Marital Status				
Never married	7	13	6	12
Ever married	48	87	45	88
Education				
Completed high school	42	75	36	71
Did not complete high school	14	25	15	29
Involvement with Client				
Very involved	44	79	42	82
Somewhat involved	8	14	9	18
Slightly involved	4	7	0	0
Continuous Variables	Mean	(SD)	Mean	(SD)
Age	50.85	(14.73)	45.96	(14.92)

Table 3
Significant Site Differences in Client Background, Clinical, Substance Abuse, and Key Relative Involved in Family Study

Client Background	Los Angeles		Boston		Chi-square	p
	N	%	N	%		
Latino						
No	21	36	41	84	24.557	.000***
Yes	37	64	8	16		
Living Situation						
With family	42	72	26	52	4.798	.023*
Independent	16	28	24	48		
Symptomatology	<u>N</u>	<u>Mean</u> (<u>SD</u>)	<u>N</u>	<u>Mean</u> (<u>SD</u>)	<u>t</u>	<u>p</u>
BPRS: Total	58	2.29 (.50)	50	1.72 (.41)	6.39	.000***
Depression	58	3.12 (.96)	49	2.23 (.87)	4.93	.000***
Activation	58	1.88 (.74)	50	1.36 (.46)	4.42	.000***
Psychosis	58	2.54 (1.14)	50	1.61 (.65)	5.30	.000***
Substance Abuse	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>Chi-square</u>	<u>p</u>
Drug Diagnosis						
No	6	10	16	32	7.763	.005**
Yes	52	90	34	68		
Amphetamine						
No	32	56	44	92	16.451	.000***
Yes	25	44	4	8		
Cocaine						
No	47	83	31	65	4.357	.031*
Yes	10	18	17	35		
Opioids						
No	53	93	38	79	4.304	.037*
Yes	4	7	10	21		
Drug Use Scale	<u>N</u>	<u>Mean</u> (<u>SD</u>)	<u>N</u>	<u>Mean</u> (<u>SD</u>)	<u>t</u>	<u>p</u>
	58	3.93 (.88)	48	3.08 (1.41)	3.62	.001***
Client Importance of Alcohol Treatment	58	1.81 (1.65)	50	1.16 (1.45)	2.18	.031*
Client Importance of Drug Treatment	58	2.59 (1.60)	50	1.08 (1.56)	4.93	.000***
Key Relative	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>Chi-square</u>	<u>p</u>

Client Background	Los Angeles		Boston		Chi-square	p
	N	%	N	%		
Intoxication						
Did not use	50	88	34	69	5.384	.019*
Intoxicated/used in past 30 days	7	12	15	31		
	<i>N</i>	<i>Mean</i> - <i>(SD)</i>	<i>N</i>	<i>Mean</i> <i>(SD)</i>	<i>t</i>	<i>p</i>
FEIS						
Benefits	58	1.65 (.91)	49	1.17 (.12)	2.80	.006**
Subjective ADL burden	58	.24 (.29)	49	.43 (.46)	-2.50	.014*

*
p < .05
**
p < .01

p < .001

Table 4

Significant Predictors of Engagement in Family Dual Disorder Programs

Categorical Variables	Engaged		Not Engaged		df	Chi-Square	p		
	N	%	N	%					
Site									
Boston	48	96	2	4	1	7.61	.01		
Los Angeles	45	78	13	22					
Ethnicity									
Latino	35	78	10	22	1	4.34	.037		
Not Latino	57	92	5	8					
Relative Employment Status									
Unemployed	19	45	23	55	2	6.05	.048		
Part-time employed	11	55	9	45					
Full-time employed	32	71	13	29					
Client Amphetamine Use Disorder									
No	69	91	7	9	1	4.05	.05		
Yes	22	76	7	24					
Continuous Variables	N	Mean	(SD)	N	Mean	(SD)	t	p	
Alcohol Use Disorder Scale	91	3.12	(1.24)	15	3.73	(0.96)	104	2.19	.039
Relative FEIS Benefits	43	1.32	(0.90)	15	2.04	(0.77)	106	2.92	.004
Relative FEIS Stigma	92	0.23	(0.27)	15	0.10	(0.14)	105	2.85	.007

Table 5

Significant Predictors of Exposure to Family Dual Disorder Programs

Categorical Variables	Exposed		Not Exposed		df	Chi-Square	p		
	N	%	N	%					
Site									
Boston	35	70	15	30	1	5.21	.031		
Los Angeles	28	48	30	52					
Client Gender									
Male	49	65	27	35	1	3.98	.046		
Female	14	44	18	56					
Relative Employment Status									
Unemployed	19	45	23	55	2	6.05	.048		
Part-time employed	11	55	9	45					
Full-time employed	32	71	13	29					
Client Amphetamine Use Disorder									
No	50	66	26	34	1	5.17	.028		
Yes	12	41	17	59					
Continuous Variables	N	Mean	(SD)	N	Mean	(SD)	t	p	
Days drug use: past 6 months	63	32.67	(43.78)	45	55.09	(56.35)	2.23	.028	
Interviewer Rating									
Drug severity	59	2.49	(2.60)	44	3.64	(2.72)	2.17	.033	
Likelihood client will finish program	21	0.55	(0.55)	18	2.56	(0.70)	37	2.71	.01
Client Rated Need for Drug Treatment	63	1.57	(1.71)	45	2.33	(1.72)	106	2.28	.025