

Closing Service System Gaps for Homeless Clients with a Dual Diagnosis: Integrated Teams and Interagency Cooperation

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Abstract

Background: There is great concern about fragmentation of mental health service delivery, especially for dually diagnosed homeless people, and apprehension that such fragmentation adversely affects service access and outcomes.

Aims of the Study: This study first seeks to articulate two alternative approaches to the integration of psychiatric and substance abuse services, one involving an integrated team model and the other a collaborative relationship between agencies. It then applies this conceptualization to a sample of dually diagnosed homeless people who participated in the ACCESS demonstration.

Methods: Longitudinal outcome data were obtained through interviews at baseline, 3 months, and 12 months with homeless clients with a dual diagnosis ($N = 1074$) who received ACT-like case management services through the ACCESS demonstration. A survey of ACCESS case managers was conducted to obtain information on: (i) the proportion of clients who received substance abuse services directly from ACCESS case management teams, and the proportion who received services from other agencies; and (ii) the perceived quality of the relationship (i.e. communication, cooperation and trust) between providers – both within the same teams and between agencies. Hierarchical linear modeling was then used to examine the relationship of these two factors to service use and outcome with mixed-model regression analysis.

Results: Significant ($p < .05$) and positive relationships were observed in 4 of the 20 analyses of the association of service use and measures of communication, cooperation, and trust (either intra-team or inter-agency) while none were significant and negative. At 12 months, receipt of a higher proportion of services from agencies other than the ACCESS team was associated with fewer days homeless, and greater reduction of psychiatric symptoms, contradicting the hypothesis that integrated team care is more effective than interagency collaborations.

Discussion and Limitations: This study broadens the conceptual

framework for addressing service system fragmentation by considering both single team integration and interagency coordination, and by considering both program structure and the quality of relationships between providers. Data from a multi-site outcome study demonstrated suggestive associations between perceptions of communication, cooperation and measures of clinical service use. However, the proportion of clients treated entirely within a single team was associated with poorer housing and psychiatric outcomes. These empirical results must be regarded as illustrative rather than conclusive because of the use of a non-experimental study design, imperfections in the available measures, and the incomplete sampling of case managers.

Implications for Health Policy: This study suggests that fragmentation of services for dually diagnosed clients may be reduced by improving the interactions within and between agencies providing these services. While primary emphasis has been placed on developing integrated teams, interagency approaches should not be prematurely excluded.

Implications for Future Research: Research on approaches to reducing system fragmentation have focused on either global efforts to integrate numerous agencies in a community or highly focused efforts to develop specialized teams. Future research should also focus on the possibility of fostering constructive relationships between selected pairs or subsets of agencies. Research in this area will also benefit from the further development measures of team integration and of both intra-team and inter-agency communication, collaboration, and trust.

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Introduction

There has been growing concern in recent years that the fragmentation of mental health services adversely affects the accessibility of services to people with severe mental illness which in turn impairs their health and well-being.^{1,2} The interim report of the President's New Freedom Commission on Mental Health, convened to identify problems with the US mental health system, concluded that, "Medical science has devised treatments and services that work, but the system cannot efficiently deliver them. The mental health system is fragmented... and in need of dramatic reform."³

Attempts to address the fragmentation of the mental health

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service system have occurred on both the larger mental health system (macro) level² and the individual clinic or team (micro) level.⁴⁻⁶ Each has met with varied success. Approaches to this problem at the system level have included the development of unified mental health agencies⁷ and deployment of such strategies as implementing a systems integration coordinator position or an interagency coordinating body to coordinate activities across agencies.^{2,8} Other strategies have included cross-training staff on the jobs of partner agencies and initiation of client tracking systems.⁸ While studies have shown that these strategies can be effective at increasing cooperation and communication between providers,^{8,9} corresponding improvements either in the amounts or types of mental health services used by individual clients, or in client outcomes, have been lacking.^{10,11}

In contrast, initiatives focused on integration at the individual clinic and team level have been more successful in both demonstrating an increase in access to services, as well as improved outcomes.⁴⁻⁶ For example, Assertive Community Treatment (ACT) is an integrated treatment that brings together providers from various disciplines to work together as a unified team with a single leader, a common location, and a shared caseload. Compared to non-team-based case management approaches, ACT is superior in reducing psychiatric hospitalization.¹² Clinic-level integration strategies also have demonstrated improved client outcomes over standard (non-integrated) treatment when mental health care is integrated into primary care clinics¹³ and when primary care is introduced into to psychiatric clinics.¹⁴

There has been particular concern about the fragmentation of services used by dually diagnosed clients who need treatment for with both a mental illness and co-occurring substance disorder.¹⁵ Historically consumers with both psychiatric and substance abuse disorders are often forced to seek uncoordinated services from separate agencies for each disorder.¹⁶ Substance abuse may be an exclusion criterion for some mental health programs, and mental illness may exclude others from substance abuse treatment, thereby limiting access to services. In addition, there have been wide ideological differences between psychiatric and addiction providers, potentially reducing communication and cooperation between these caregivers.¹⁷

Previous efforts to amalgamate services on a clinical level for those with a dual diagnosis have emphasized integration through the establishment of small, carefully structured teams, believed to increase communication, cooperation, and coordination between clinicians serving the same clients.¹⁷ There has been only one, randomized, controlled study of such treatment. In that study, Drake *et al.*¹⁸ found that ACT with the addition of an integrated substance abuse treatment was superior to standard treatment on five of thirteen substance abuse outcome measures.

This perspective is consistent with recent developments in organization theory,¹⁹ and transaction cost economics,²⁰ which suggest that improvements in communication and cooperation might be effected in either of two ways: by creating a small, bounded teams, as exemplified by the ACT approach; or, alternatively, by increasing functional coordination across agencies. For example, two providers

from separate agencies might be able to work just as collaboratively as if they were on the same team if they have a history of successful collaboration that maximizes the communication, cooperation, and trust between providers. These activities might include working together on shared cases, joint participation in professional societies, and shared training experiences,²¹ such as those designed to foster good interagency working relationships. However, we know of no studies that have examined communication, cooperation, and trust between providers working in different agencies, or the relationship of these factors to service use, and client outcomes.

In addition, while the quality of implementation of the ACT model has been assessed by measures that address team composition, the frequency of staff interaction, and intensity and location of service delivery,²² measures of the quality of communication, cooperation and trust that may be essential to the functioning of ACT teams, as well as to other types of clinical collaborations, have yet to be developed. Such measures are needed to determine whether and under what circumstances interagency relationships can achieve levels of collaboration that are similar to those of small teams. The current study presents an initial effort to develop such a measure.

In this study, we hypothesized that higher levels of perceived communication, cooperation, and trust between mental health and substance abuse providers would be associated with greater access to services and better client outcomes, independent of the specific type of service integration strategies, or the locus of integration (system, clinic, or team). In addition, following the findings of Drake and colleagues,¹⁸ we also hypothesized that when substance abuse services were provided more frequently within an integrated team, client outcomes would be better. We thus sought to demonstrate an approach to the evaluation of two factors which may improve access to services and outcomes among dually diagnosed clients: (i) delivery of services through unified *integrated teams*, and (ii) intra-team and inter-agency levels of *communication, cooperation, and trust* among providers.

We used data from two sources: clinical assessment interviews from a subset of dually diagnosed clients from the Access to Community Care and Effective Services and Supports (ACCESS) project (described below); and a survey of ACCESS case managers which documented their perceptions of our two factors. First, since ACT teams may vary in the proportion of dually diagnosed clients to whom they provide fully integrated services, we asked them to estimate the proportion of their clients who received substance abuse treatment from within their own agency, and/or from outside substance abuse or dual diagnosis agencies, in order to determine the extent to which clients on each team received services from integrated teams. We thus present an initial attempt at measuring team integration as a continuous variable.

Second, we also inquired about the level of communication, cooperation, and trust they perceived between themselves and a) colleagues who provided substance abuse services to their clients within their own team, and b) colleagues

in other agencies who provided substance abuse services to their clients. Here, too, we present a first effort at measuring hitherto un-addressed and potentially important determinants of the quality of service delivery to clients with complex needs. We hypothesize that better access to services and positive client outcomes would be associated with both receiving services from teams delivering a high proportion of substance abuse services within their own team structure (integrated services), and when relationships of communication, cooperation, and trust are strong, independent of whether services were delivered within a bounded team, or an external agency (coordinated services).

Our goals are both conceptual and empirical. First, we strive to present a more generalized conceptualization of approaches to reducing system fragmentation that addresses the role of communication, cooperation and trust between clinicians and to demonstrate a first effort at measuring these dimensions of service delivery. Second, we present a first empirical effort at simultaneously evaluating both structural and relational factors that may affect outcomes for dually diagnosed clients.

Methods

The ACCESS Program

The ACCESS demonstration was conducted from 1994 to 1998 at 18 agencies within nine states within the United States. All participating agencies received funding to provide case management based on the ACT model to homeless persons with serious mental illness and were required to enroll 100 clients each year for a total of 400 ACCESS ACT clients per agency (7200 clients across all agencies, all years).² Half of these agencies also received funds to implement systems-level integration strategies; however, these strategies have previously been shown to have no impact on either access to services or client outcomes.¹¹

Client Survey

Sample

Clients were eligible to receive case management services from the ACCESS ACT teams if they were homeless, had a diagnosis of severe mental illness, and were not currently involved in ongoing community treatment. Clients who gave written informed consent were evaluated with a comprehensive interview at baseline and were reinterviewed three and 12 months later.

For these analyses, we first selected the subset of all ACCESS ACT clients ($N = 1336$) with co-occurring substance use disorders who were treated by the ACT teams. We then refined our sample with two further inclusion criteria: (i) a minimum of five case managers from their host agency completed the case manager survey (described below) and (ii) the client completed the 12-month follow-up evaluation interview. The final sample consisted of 1074 participants from 10 ACCESS agencies.

Measures

Client characteristics, including age, sex, race, number of days employed, income, receipt of public support payments, and history of homelessness, were obtained by interview.

We examined seven outcomes. The first, severity of psychiatric symptoms, was measured by a mental health index created by averaging standardized scores on three mental health outcome measures: the depression scale of the Diagnostic Interview Schedule (DIS)^{2,23} the psychotic symptom scale of The Psychiatric Epidemiology Research Interview (PERI),^{5,24} and the psychiatric composite problem index from the Addiction Severity Index (ASI).²⁵ This composite scale has demonstrated adequate internal consistency and test-retest reliability.¹¹

Days used alcohol and days used drugs was measured by a count of the number of days of self-reported use of each in the 30 days prior to the assessment, and then subtracting the number of days used alcohol or drugs at the 12-month follow-up point from the number of days used at the baseline assessment. We also created a variable to represent days homeless using the same procedure.

Service use was assessed with a series of 23 questions, developed specifically for the ACCESS evaluation, about use of various types of health and social services during the 60 days before the interview. Dichotomous variables (scored as 0 or 1) were created as indicators of the use of each of six types of services: housing assistance or support from a housing agency, mental health services, substance abuse services, general health care, public income support (at least \$100 a month), and vocational rehabilitation. We used three service use measures as outcomes: (i) the sum of these six dichotomous variables to form an index of services integration that was equal to the number of domains in which services were received, (ii) the amount of psychiatric outpatient services received, and (iii) the amount of substance abuse outpatient services received.¹¹ We examined service use at both the 3 and 12-month assessment points, as service use is likely to peak early in treatment, and decrease over time.

Case Manager Survey

Procedure

Case managers at each of the 18 agencies were asked to complete the ACCESS Case Manager Survey. The survey was distributed by mail to all case managers providing services in the ACCESS study in 1998, the last year of the demonstration. Because the survey was anonymous, and no demographic information was asked on the survey, we do not have specific information about the sample of case managers who responded to the study, nor do we know the response rate of those who completed the study.

Measure

The ACCESS Case Manager Survey, created specifically for this study, is organized into five sections, each further divided into six items. In the first section, case managers were asked to identify the percentage of clients provided

substance abuse treatment from each of the following providers: (i) the case manager completing the form (self), (ii) other members of the case manager's team, (iii) substance abuse specialists in the same agency, but not on the same case management team, (iv) providers from external substance abuse agencies, (v) providers from external dual-diagnosis agencies, (vi) services provided by self-help programs (AA, NA, etc.) These data were combined to create indicators of the proportion of clients who received substance abuse services (i) directly from the ACCESS team and (ii) from other agencies (Table 1, columns 3 and 4).

The next four sections of the survey ask clinicians to rate their perceptions of the (i) clarity of communication, (ii) agreement on clinical goals, (iii) level of trust, and (iv) skill in treating dually diagnosed clients, when services are provided by each of the six types of providers listed above. Responses for these 24 items range from 1 to 5, with higher scores indicating more positive responses.

Data Analysis

Preparation of ACCESS Case Manager Survey

First, to meaningfully combine items from ACCESS Case Manager Survey, we analyzed the 24 perception items using Principal Components Analysis (PCA) with Varimax rotation, allowing for a solution with all Eigenvalues greater than one. This resulted in a seven-factor solution that was not interpretable. We then created forced four- and three-factor solutions. Ultimately, we selected the three-factor solution as the most interpretable, with factors reflecting Perceptions of Relations within ACCESS Team/Own Agency, Perceptions

of Relations with Other Agencies, and Perceptions of Relations with 12-Step Programs (Table 2).

We then created subscale scores by averaging the scores across items within each factor (Table 1). Internal Consistency (Chronbach's alpha) for the three perception subscales was good: .84 for Perceptions of Relations with 12-Step Programs, .91 for Perceptions of Relations with Other Agencies, and .93 for Perceptions of Relations within ACCESS Team/Own Agency. We calculated correlations between the subscales, and between each item within each subscale, and between each item and the other subscales (Table 1). All correlations between items and their corresponding subscales were higher than those between items and other subscales, indicating adequate discrimination between subscales. In general, case managers' perceptions of relations within their own agencies were more positive than those with staff of other agencies, which in turn were more positive than those of 12-step programs. Paired t-tests comparing the subscale scores for the entire sample of case managers showed that Perceptions of Relations within ACCESS Team/Own Agency were evaluated more positively than Perceptions of Relations with Other Agencies ($M = 3.42, SD = .63$ vs. $M = 2.96, SD = .69$; $t(71) = 6.73, p < .0001$). In turn, Perceptions of Relations with Other Agencies were significantly more positive than Perceptions of Relations with 12-Step Programs ($M = 2.96, SD = .69$ vs., $M = 2.26, SD = .81$; $t(84) = 8.12, p < .0001$). Perceptions of Relations within ACCESS Team/Own Agency were also evaluated more positively than Perceptions of Relations with 12-Step Programs ($M = 3.42, SD = .63$, vs., $M = 2.26, SD = .81$; $t(68) = 10.26, p < .0001$; Table 1).

Table 1. ACCESS Case Managers' ($N = 96$) Ratings by Site

Site number	Number of Respondents ^a (range)	Percent Treated by ACCESS Team	Percent Treated by Other Agencies	Perceptions of Own Agency	Perceptions of Other Agencies	Perceptions of 12-Step Programs
		<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
1	7 - 10	42.8 (34.0)	52.0 (32.0)	3.48 (.50)	2.93 (.37)	2.54 (.46)
2	9 - 12	69.2 (47.1)	35.0 (17.2)	3.58 (.74)	2.69 (.84)	1.89 (.91)
3	6 - 7	27.1 (26.7)	20.9 (18.2)	3.69 (.25)	3.20 (.81)	2.26 (1.14)
4	8 - 18	31.9 (47.7)	64.7 (26.3)	2.85 (.86)	2.63 (.80)	2.08 (.70)
5	6 - 7	27.9 (28.7)	86.4 (29.4)	3.59 (.66)	3.37 (.77)	3.07 (1.09)
6	6	72.5 (54.7)	52.5 (26.6)	3.94 (.25)	3.47 (.54)	2.90 (1.04)
7	8	42.5 (53.7)	47.0 (28.8)	2.88 (.41)	2.54 (.47)	1.95 (.86)
8	10	37.0 (33.3)	53.7 (29.7)	3.38 (.42)	2.73 (.59)	2.14 (.30)
9	6 - 9	75.0 (37.2)	35.0 (38.1)	3.28 (.52)	2.70 (.26)	2.14 (.56)
10	6 - 9	56.1 (49.2)	53.3 (31.9)	3.83 (.57)	2.89 (.69)	2.20 (.65)
Total ^b	73 - 96	47.3 (44.3)	50.8 (31.2)	3.42 (.63)	2.96 (.69)	2.26 (.81)
Internal Consistency		—	—	.93 ($n = 73$)	.91 ($n = 92$)	.84 ($n = 88$)

Note: Ratings of perceptions range from 1 to 5, with higher scores indicating more favorable impressions.

^a Not all case managers answered all questions.

^b Paired t-tests indicate all Perceptions of Relations subscales are significantly different from each other at $p < .0001$.

Table 2. ACCESS Case Manager Survey: Item Analysis

Item	Factor Loading	M (SD)	Item - Subscale Correlation	Item - Other Correlation
Perceptions of ACCESS Team and Own Agency (n = 73)				
How clear is <i>communication</i> with your colleagues when you provide services?	.49	3.68 (.81)	.52	.34 - .46
How clear is <i>communication</i> with your colleagues when others on your team provide services?	.79	3.58 (.94)	.74	-.04 - .17
How clear is <i>communication</i> with your colleagues when specialists elsewhere in your agency provide services?	.52	2.97 (.93)	.66	.17 - .20
How do you rate your <i>agreement on clinical goals</i> with your colleagues when you provide services?	.71	3.58 (.85)	.70	.24 - .42
How do you rate your <i>agreement on clinical goals</i> with your colleagues when others on your team provide services?	.81	3.51 (.94)	.81	.11 - .34
How do you rate your <i>agreement on clinical goals</i> with your colleagues when specialists elsewhere in your agency provide services?	.58	3.26 (.96)	.68	.23 - .38
How do you rate the <i>level of trust</i> between yourself and your colleagues when you provide services?	.62	3.86 (.80)	.64	.28 - .45
How do you rate the <i>level of trust</i> between yourself and your colleagues when others on your team provide services?	.82	3.68 (.90)	.74	.13 - .36
How do you rate the <i>level of trust</i> between yourself and your colleagues when specialists elsewhere in your agency provide services?	.54	3.34 (.95)	.65	.18 - .26
How would you rate your own <i>skills</i> in treating dually diagnosed clients?	.43	3.41 (.78)	.41	.26 - .39
How would you rate the level of <i>skill</i> in treating dually diagnosed clients when others on your team provide services?	.79	3.53 (.88)	.73	.13 - .15
How would you rate the level of <i>skill</i> in treating dually diagnosed clients when specialists elsewhere in your agency provide services?	.66	3.51 (.93)	.64	.20 - .29
How <i>effective</i> do you feel you are when you treat dually diagnosed clients?	.50	3.08 (.83)	.55	.29 - .30
How <i>effective</i> do you feel others on your team are when they treat dually diagnosed clients?	.72	3.23 (.91)	.70	.37 - .49
How <i>effective</i> do you feel specialists elsewhere in your agency are when they treat dually diagnosed clients?	.60	3.10 (.92)	.66	.37 - .43
				.34 - .41



→ Table 2. ACCESS Case Manager Survey: Item Analysis

Item	Factor Loading	M (SD)	Item - Subscale Correlation	Item - Other Correlation
Perceptions of Other Substance Abuse or Dual Diagnosis Agencies (n = 92)				
How clear is <i>communication</i> with providers from other substance abuse agencies when they serve your clients?	.67	2.51 (.92)	.65	.46 - .57
How clear is <i>communication</i> with providers from other dual diagnosis agencies when they serve your clients?	.78	2.66 (.87)	.66	.31 - .34
How do you rate your <i>agreement on clinical goals</i> with providers from other substance abuse agencies when they serve your clients?	.51	2.71 (.90)	.56	.29 - .44
How do you rate your <i>agreement on clinical goals</i> with providers from other dual diagnosis agencies when they serve your clients?	.70	2.74 (.89)	.69	.26 - .38
How do you rate the <i>level of trust</i> between yourself and providers from other substance abuse agencies when they serve your clients?	.66	2.86 (.97)	.74	.38 - .47
How do you rate the <i>level of trust</i> between yourself and providers from other dual diagnosis agencies when they serve your clients?	.76	2.93 (1.03)	.73	.32 - .49
How would you rate the level of <i>skill</i> in treating dually diagnosed clients at other substance abuse agencies?	.64	3.10 (.98)	.66	.34 - .54
How would you rate the level of <i>skill</i> in treating dually diagnosed clients at other dual diagnosis agencies?	.77	3.29 (.90)	.68	.26 - .29
How would you rate the <i>effectiveness</i> of providers at other substance abuse agencies?	.52	2.82 (.95)	.61	.49 - .28
How would you rate the <i>effectiveness</i> of providers at other dual diagnosis agencies?	.68	2.96 (.90)	.69	.40
Perceptions of Twelve-Step and Other Self-Help Groups (n = 88)				
How clear is <i>communication</i> with providers from self-help programs when they serve your clients?	.60	1.73 (.99)	.56	.49 - .51
How do you rate your <i>agreement on clinical goals</i> with providers from self-help programs when they serve your clients?	.77	2.15 (1.01)	.65	.34 - .57
How do you rate the <i>level of trust</i> between yourself and providers from self-help programs when they serve your clients?	.78	2.51 (1.07)	.71	.13 - .46
How would you rate the level of <i>skill</i> in treating dually diagnosed clients at self-help programs?	.69	2.49 (1.06)	.62	.26 - .47
How would you rate the <i>effectiveness</i> of providers at self-help programs?	.79	2.42 (1.01)	.69	.32 - .52
				.28 - .47
				.30 - .39

Test of Hypotheses

We then ran two sets of seven mixed-effects regression models, using each of the seven primary outcomes as the dependent variable and two subscales from the ACCESS Case Manager Survey as independent variables, for a total of 14 models (first set of seven models used percent of clients treated by own team, and Perceptions of Relations within ACCESS Team/Own Agency as independent variables; the second set of seven models used percent of clients treated by another agency and Perceptions of Relations with Other Agencies). Because we were primarily interested in the relationships between agencies, we only used the two measures of proportion of clients treated by one's own team, and proportion of clients treated by another agency, as well as the subscales measuring of Perceptions of Relations within ACCESS Team/Own Agency and Perceptions of Relations with Other Agencies; however, for comparison we report descriptive information about case managers perceptions of 12-step programs in **Table 1**. We selected the percent treated by one's own team, rather than one's own agency, as a more appropriate test of the small team model of integrated services.

Because assignment to teams was not random, we also examined the relationship of each of these measures to baseline measures. In several cases there were significant relationships between the measures on the Case Manager Survey and client baseline characteristics. Since these characteristics could potentially confound our analysis of the relationship of survey items and outcomes, we included these covariates in all subsequent analyses.

In addition, we tested the hypothesis that when greater proportions of clients were seen by one's own agency or another agency, the quality of relations with that agency would be especially important. This was tested by examining the interaction of the two variables representing percentage of clients seen by one's own team or by other agencies with the corresponding variables for relations with one's own or another agencies, while also including the main effects in these models. Thus, we ran 20 additional models to test interaction effects.

Because multiple regression is based on the assumption that observations are independent and the observations in this study are instead clustered within site, we used hierarchical linear modeling to adjust the standard errors to adjust for the correlated nature of the data within site (SAS PROC MIXED).²⁶ All variables were recoded so that higher values indicate better outcomes. Since this is an exploratory study we used an alpha of $p < .05$ as our primary criterion of significance. However, since we examined the relationship between 6 independent variables and 10 dependent variables for a total of 60 relationships, we also apply a Bonferroni-corrected alpha of $p < .001$ to further consider whether the observed pattern of significant findings could be attributable to chance alone.

Results

Sample

Participants were predominantly male (66.1%), and either black (45.6%) or white (44.1%). We examined baseline differences between those for whom we had complete data at 12 months, and those who continued to receive ACCESS services but did not complete the evaluation. In the 30 days prior to study enrollment, non-completers drank alcohol on significantly more days, had experienced more days of homelessness, and had received fewer mental health services (**Table 3**).

Mixed-Effects Regression Analysis

We conducted ten separate mixed-effects regression models with three 3-month measures of service use seven and 12-month measures of both service use and outcome as the dependent variables (**Table 4**). There were several significant main effects. At three months, positive perceptions of relations within the ACCESS agency were significantly associated with a greater receipt of psychiatric services ($B = 6.31, SE = 2.94, p = .03$). Better perceptions of relations with other agencies were also positively and significantly associated with increased receipt of psychiatric services at three months ($B = 7.68, SE = 3.53, p = .03$). In addition, the proportion of clients treated by the ACCESS team was positively and significantly associated with the index of services integration ($B = .02, SE = .01, p = .01$). Better perceptions of relations with the agency sponsoring the ACCESS team were also positively and significantly associated with the index of services integration at the three-month follow-up ($B = .41, SE = .21, p = .05$). There were no other significant main effects, and no significant interactions at three months.

At the 12-month follow-up, there was one main effect for service use. A more positive perception of relations with one's own agency was associated with a greater index of services integration ($B = .50, SE = .26, p = .05$).

There were several main effects with outcomes at 12 months. First, a greater proportion of clients receiving substance abuse treatment from an agency *other* than the ACCESS agency was significantly and positively associated with decreased psychiatric symptoms ($B = .01, SE = .01, p = .04$). Consistent with this finding, a higher proportion of clients receiving substance abuse treatment from the ACCESS team was significantly and negatively associated with psychiatric symptoms ($B = -.01, SE = .01, p = .03$), indicating that the more clients received substance abuse services directly from the ACCESS team, the worse the psychiatric outcomes.

In addition, a greater proportion of clients receiving treatment from an agency *other* than the ACCESS agency was significantly and positively associated with the number of days homeless (i.e., fewer days of homelessness; $B = .32, SE = .07, p < .0001$). This is the only finding that was significant at the Bonferroni corrected alpha of $p < .001$. On the whole these analyses run counter to the hypothesis that

integrated teams would be more effective than interagency collaborations. There were no other significant main effects between 12-month outcomes and case manager survey responses, and there were no significant interactions.

It is notable that 4 of the 20 analyses of the association of service use and communication, cooperation, and trust were

positive and significant at $p < .05$, while none were negative and significant. With 20 analyses, only one would be expected to be significant at $p < .05$ by chance. Thus the overall pattern of results is unlikely to be due to chance and lends to support our hypothesis about the importance of relations between providers in delivering effective services.

Table 3. Comparison Between Baseline Characteristics of Study Completers and Non-Completers

Variable	Completers <i>n</i> (%) (<i>n</i> = 1074)	Non-Completers <i>n</i> (%) (<i>n</i> = 262)	Test of Significance
Gender			
Female	364 (33.9%)	61 (23.3%)	$\chi^2(1) = 10.9$ $p = .0009$
Male	710 (66.1%)	201 (76.7%)	
Ethnicity			
American Indian or Alaskan Native	33 (3.1%)	17 (6.5%)	$\chi^2(5) = 16.5$ $p = .006$
Asian or Pacific Islander	10 (0.9%)	2 (.8%)	
Black	489 (45.6%)	89 (34.0%)	
Hispanic	43 (4.0%)	12 (4.6%)	
White	473 (44.1%)	137 (52.3%)	
Other	24 (2.2%) (<i>n</i> = 1072)	5 (1.9%)	
Employment Pattern Prior 12 Months			
Full-time employment	82 (7.7%)	23 (8.8%)	$\chi^2(5) = 13.0$ $p = .02$
Part-time employment	37 (3.5%)	10 (3.8%)	
Irregular paid work (full- or part-time)	320 (29.9%)	102 (38.9%)	
Disability	300 (28.0%)	58 (22.1%)	
Unemployed	288 (26.9%)	65 (24.8%)	
Other	45 (4.2%) (<i>n</i> = 1072)	4 (1.5%)	
Self-Reported History of Childhood Abuse (Any Type)			
Yes	746 (69.5%)	186 (71.0%)	$\chi^2(1) = .2$ n.s.
No	327 (30.5%) (<i>n</i> = 1073)	76 (29.0%)	
Ever Convicted of a Crime			
Yes	636 (59.3%)	173 (66.3%)	$\chi^2(1) = 4.3$ $p = .04$
No	436 (40.7%) (<i>n</i> = 1072)	88 (33.7%)	
Age at Baseline (<i>M, SD</i>)	37.8 (8.4)	36.8 (9.2)	$t(1334) = .15$, n.s.
Years of Education (<i>M, SD</i>)	11.4 (2.5) (<i>n</i> = 1072)	11.4 (2.3)	$t(431) = -.06$, n.s.
Number of Times Homeless (<i>M, SD</i>)	5.7 (13.8) (<i>n</i> = 1057)	5.8 (8.7) (<i>n</i> = 255)	$t(544) = .09$, n.s.
Number of Times Hospitalized for Psychiatric Problems (<i>M, SD</i>)	5.2 (9.2) (<i>n</i> = 1063)	4.7 (8.7) (<i>n</i> = 260)	$t(1321) = -.86$, n.s.
Mental Health Symptoms (<i>M, SD</i>)	.41 (.62) (<i>n</i> = 1061)	.36 (.62) (<i>n</i> = 259)	$t(1318) = -1.20$, n.s.
Days Drank Alcohol (past 30) (<i>M, SD</i>)	3.70 (7.10) (<i>n</i> = 1069)	4.70 (7.66) (<i>n</i> = 261)	$t(1328) = 2.00$, $p = .05$
Days Used Drugs (past 30) (<i>M, SD</i>)	5.53 (11.88)	6.50 (12.00)	$t(1334) = 1.19$, n.s.
Days Homeless (past 30) (<i>M, SD</i>)	36.85 (20.52)	39.59 (20.63)	$t(1334) = 1.93$, $p = .05$
Psychiatric Services (<i>M, SD</i>)	5.96 (10.37)	5.95 (12.04)	$t(361) = -.01$, n.s.
Substance Abuse Services (<i>M, SD</i>)	3.13 (8.58)	3.18 (9.52)	$t(371) = .08$, n.s.
Sum of all Core Services (<i>M, SD</i>)	2.14 (1.32)	1.87 (1.26)	$t(1334) = -3.00$, $p = .003$

Table 4. Mixed-Effects Regression Analyses (N = 1074)

Variable	Percent Treated by Own Team			Perceptions of Own Agency			Perception by Percent Interaction: Own			Percent Treated by Other SA or DD Agency			Perceptions of Other Agency			Perception by Percent Interaction: Other			
	Est	SE	p	Est	SE	p	Est	SE	p	Est	SE	p	Est	SE	p	Est	SE	p	
<i>3 Mo. Outpt. Services</i>																			
Psychiatric	.11	.12	n.s.	6.31	2.94	.03	.39	.35	n.s.	-.03	.13	n.s.	7.68	3.53	.03	.14	.47	n.s.	
Substance Abuse	.04	.04	n.s.	-.18	1.06	n.s.	-.03	.13	n.s.	-.00	-.04	n.s.	-1.09	1.17	n.s.	-.07	.16	n.s.	
Index of Integration ^a	.02	.01	.01	.41	.21	.05	-.00	.03	n.s.	-.01	.01	n.s.	.03	.09	n.s.	.03	.04	n.s.	
<i>12-Mo. Outpt. Services</i>																			
Psychiatric	.04	.11	n.s.	2.67	2.76	n.s.	.24	.34	n.s.	.11	.11	n.s.	2.99	2.87	n.s.	-.19	.38	n.s.	
Substance Abuse	.05	.05	n.s.	-.01	1.22	n.s.	-.13	.15	n.s.	.02	.05	n.s.	-.30	1.40	n.s.	.03	.19	n.s.	
Types of Services ^a	-.00	.01	n.s.	.50	.26	.05	-.03	.03	n.s.	.00	.01	n.s.	.38	.31	n.s.	.01	.04	n.s.	
Psychiatric Symptoms	-.01	.01	.03	.17	.13	n.s.	-.01	.02	n.s.	.01	.01	.04	.22	.13	n.s.	.02	.02	n.s.	
Days Drank Alcohol	.01	.16	n.s.	-.66	.44	n.s.	.01	.05	n.s.	.02	.02	n.s.	.20	.47	n.s.	.09	.06	n.s.	
Days used Drugs	-.03	.03	n.s.	.32	.87	n.s.	.15	.09	n.s.	.05	.03	n.s.	.11	.86	n.s.	.06	.12	n.s.	
Days Homeless	-.06	.12	n.s.	-1.22	3.19	n.s.	.29	.39	n.s.	.32	.07	<.0001	1.04	1.86	n.s.	.24	.26	n.s.	

Note: All measures have been re-scored such that higher values indicate better outcomes.

^a Includes psychiatric outpatient, substance abuse outpatient, medical outpatient, general health care, public support payments over \$100, housing assistance, and vocational rehabilitation (range 1 - 6).

Discussion

We have presented an expanded conceptualization, and a first effort, at measuring factors associated with reduced fragmentation of service delivery for individuals with multiple service needs. We hypothesized that fragmentation may be decreased either through the establishment of small teams that provide multidisciplinary care, or through strategies that increase levels of cooperation, communication, and trust among providers either within small clinical teams or from multiple agencies. In addition we demonstrate an approach to characterizing intra-team and inter-agency relationships based on a survey of case managers.

Our analyses of the data from dually diagnosed homeless clients provide some support for this broadened conceptualization. Our most robust findings are in the three-month service use domains. Receipt of psychiatric services was greater when perceptions of both the ACCESS team and other agencies were more positive. In addition, the index of services integration was significantly and positively associated with both perceptions of the ACCESS agency, as well as with the proportion of clients treated by the ACCESS team. These findings suggest that both increasing levels of communication, cooperation, and trust among providers, and delivering services in an integrated team, can affect client access to services.

As expected, the relationship between integration and service use was weaker at the 12-month assessment. There was one significant main effect – when the perceptions of one's own agency were high, there was a higher index of services integration. This is consistent with the three-month findings, and with findings that service use is highest early in treatment, and naturally decreases over time.¹¹

Although the service use findings were supportive of our central hypotheses, the analyses of clinical outcomes were less consistent. We saw no significant main effects for our measures of either drug or alcohol use, while clients seen at agencies where a higher proportion of substance abuse services were received from an outside agency experienced significantly fewer days homeless, a finding that remained significant even after adjustment for multiple comparisons. Additionally, the greater the proportion of clients who received substance abuse services from *other* agencies, the better the psychiatric outcomes. These findings, although preliminary, tend to undermine the hypothesis that services provided by small, integrated teams yield better client outcomes. The overall pattern of findings is more supportive of the hypothesis that communication, cooperation and trust among providers is associated with program effectiveness in either the integrated-team or interagency-collaboration approaches.

Several limitations of this study require comment. First, data on measures of intra-team and inter-agency relationships were incomplete since not all case managers responded to the survey. In addition, because the measure assesses personal impressions of relationships between providers and documents case manager estimates of the proportion of clients treated by various teams and agencies, its validity needs to be empirically demonstrated. In addition, because we only measured case manager perceptions in the final year

of the program it is unknown if case manager ratings would have been different at other times. These limitations may be reflected in wide variability in the ratings made by members of the same teams as evident in the large standard deviations reported in **Table 1**.

The Case Manager Survey also showed several strengths. The results of the factor analysis led to a highly interpretable factor structure with excellent psychometric properties. In addition, the scale showed good face validity, in that ratings of perceptions of one's own team were consistently superior to those of other agencies, which were in turn, higher than perceptions of 12-Step organizations. This survey of case manager perceptions presented here suggests a potentially valuable approach for characterizing intra-team and inter-agency relationships. While presented here as an initial effort, this measure has potential to provide a richer characterization of relationships between providers than has hitherto been available. Further development and validation of this kind of measure is an important task for future research.

A second limitation was the reliance on client self-report to identify the amount and type of services received, since we did not have access to administrative measures of service use at the client level. These measurement limitations may have weakened our ability to detect relationships between integration and service use.

Third, since this was an observational study, unmeasured differences between treatment groups may have biased our results. Although we statistically adjusted for baseline client differences, our results, like those of any study not based on random assignment, may be confounded by differences in clients across agencies.

Finally, this study may be prey to the "ecological fallacy" in that we used group-level measures to draw conclusions about individual behavior. It would have been preferable to have documentation of which specific clients on each team received integrated services from the ACT team and which received services from other agencies. Future studies should attempt to collect more specific information on the treatment provided to individual clients.

The empirical results presented here are thus suggestive, rather than conclusive. It is possible that either the context in which services are provided does not, in fact, have an association with better client outcomes, or that our methods are at too early a stage of development to reveal the full clinical benefits of system integration and interagency collaboration. Previous studies like the ACCESS project, which used pure macro interventions to reduce service system fragmentation, showed no impact on client outcomes.¹¹ The work of Drake *et al.*,¹⁸ utilizing only micro interventions, appears to have a more direct influence on outcomes. Our methods may be viewed as somewhat intermediate, using measures of both macro and micro level integration, and our mixed findings may reflect this.

Despite our modest outcome findings, and the methodological limitations noted above, notable relationships were observed between use of services and our measures of communication, cooperation and trust. We believe that these analyses broaden our conceptualization of system fragmentation and services integration and represent

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a new approach to a long-standing problem that has been highly resistant to solutions. We hope that this study will stimulate new lines of investigation that lead to improvements in the conceptualization of service provision and increasingly sophisticated measurement methods that will ultimately serve to identify integration strategies that consistently improve client outcomes.

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