

Suicidality in Seriously Mentally Ill Clients of Two Intensive Community Mental Health Programs

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ABSTRACT

The purpose of this study was to evaluate the effect of two intensive community mental health programs on the suicidality of clients with serious mental illness. Eighty individuals with severe and persistent mental illness were enrolled in this randomized controlled study comparing two models of intensive community support: Assertive Community Treatment (ACT) and Intensive Case Management (ICM). Suicidal ideation and behaviours were measured using the Modified Scale for Suicide Ideation. Study clients underwent comprehensive interviews at baseline and were reinterviewed 9 and 18 months later. The Dartmouth Assertive Community Treatment Scale (DACTS) instrument was used to gain more insight into the specific ACT and ICM program structures and characteristics that provide crisis support and suicide intervention. A chart review of 2 randomly chosen months of service looked at the on-call after-hours pager use of ACT program clients. The ACT intervention was effective in reducing suicidal ideation over 18 months. In addition, the prevalence of suicidal ideation was significantly lower at 18 months in ACT clients versus ICM clients. This is the first study to suggest that ACT may confer some additional benefit in terms of reduced suicidality in clients with severe and persistent mental illness.

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Individuals with severe and persistent mental illnesses are at high risk for suicide. For example, it is estimated that 10% to 13% of persons with schizophrenia-spectrum disorders will commit suicide and a further 20% to 40% will attempt suicide during their lifetimes. The prevalence of schizophrenia in individuals who commit suicide ranges from 2% to 12% (Harkavy-Friedman, Restifo, & Malaspina, 1999). Risk factors for suicide among individuals with schizophrenia include adult age, male sex, and mean illness duration of less than 10 years. Also associated with suicide risk are comorbid depressive symptoms, substance abuse, previous suicide attempts, and recent hospitalization (Harkavy-Friedman et al., 1999). Those who are early in the course of their illness and who have some insight into the devastation that the illness has caused may be at particularly high risk (Drake, Gates, Cotton, & Whitaker, 1984).

The community mental health field has responded to the service needs of this high risk, seriously mentally ill population by introducing various models of case management to provide intensive community treatment, rehabilitation, and support (Rapp, 1998; Ziguras & Stuart, 2000). One such model of care is known as Assertive Community Treatment (ACT). ACT relies on a multidisciplinary team to deliver services 7 days per week, including crisis response 24 hours per day by pager or in person. Caseloads are shared and small (8 to 10 clients per team member) to ensure continuity of care and appropriate service intensity for those clients with high service needs (Stein & Santos, 1998). This model has been extensively researched since its development in the early 1970s. Early reviews of the research suggested that compared with traditional clinical case management, assertive community treatment resulted in reduced hospitalizations, more housing stability, better employment status, and greater patient satisfaction (Marshall & Lockwood, 1998). Recent studies have shown more modest benefits, suggesting that ACT clients spend fewer days in hospital, but that both ACT and clinical case management produce similar improvements in clinical symptoms, client satisfaction, and social functioning (Ziguras & Stuart, 2000). A randomized controlled study from England has suggested that community mental health teams were equally able to support individuals with serious mental illnesses but that ACT may offer better engagement and greater satisfaction with services (Killaspy et al., 2006).

Over time, ACT has evolved as the model of case management with the most clearly defined implementation standards for program characteristics such as staffing levels, team composition, caseload size, frequency and intensity of contacts, and hours of operation. Careful attention to implementation of these standards has led to the development of a tool—the Dartmouth Assertive Community Treatment Scale (DACTS)—to measure program fidelity to the ACT model (Teague, Bond, & Drake, 1998).

Another commonly implemented model of community support for high-risk individuals with serious mental illness is known as Intensive Case Management (ICM). As the name indicates, ICM, like ACT, is more intensive than conventional case management models, with relatively small caseload sizes (approximately 15 clients per case manager). However, unlike ACT, ICM has historically had less clearly defined standards for implementation of program structures, such as hours of operation and crisis response, and the model is based on individual caseloads instead of on a team approach (Ontario Ministry of Health and Long-Term Care, 2005; Schaedle & Epstein, 2000; Schaedle, McGrew, Bond, & Epstein, 2002).

Very little research has focused on the effectiveness of various models of community care in managing the suicidality of high-risk clients with serious mental illnesses. Suicidality has been studied

in only a few published papers focusing on community models of care. Johnson, Leese, and Brooks (1998) examined a variety of adverse events in patients receiving intensive specialist mental health services versus standard primary care services. Retrospective data regarding adverse events were gathered for individuals identified as having psychotic illnesses. The rates of adverse events, including suicidal behaviour, were low with no significant differences between types of care.

Walsh et al. (2001) specifically examined the effect of ICM versus standard care on the prevalence of suicidal behaviour in individuals with psychosis. Each individual in the study was assigned to a case manager; however, the ICM team and the standard care teams differed in caseload size. The ICM case managers each had a caseload of 10 to 15 clients, versus caseloads of 30 or more clients for the standard care case managers. The researchers found no significant difference in the prevalence of suicidal behaviour between treatment groups. They also noted that recent suicide attempts and multiple hospital admissions were the best predictors of future attempts.

Dekker et al. (2002) looked at the possibility that the risk for suicide in ACT clients might in fact increase given that these clients were living in the community rather than on an inpatient ward. The researchers found no difference in suicide rates between groups but suggested that longer follow-up may be needed to fully understand the issue.

A qualitative study of crises experienced by clients with serious mental illness in ACT and ICM programs serving the inner city of Toronto, Canada, indicated an underlying vulnerability to crises due to the continued presence of illness symptoms and such complex social stressors as loneliness, poverty, homelessness, poor family support, and heightened stress levels. The study participants described the symptoms and emotions triggered in crisis situations as euphoria, anxiety, agitation, anger, aggression, and "being low." The state of "being low" had a slower onset than other crisis states but more commonly led to lack of motivation, feelings of depression, and eventually to suicidality. The study found that although some individuals preferred to manage such crisis states alone (by retreating, taking medications, and waiting for the symptoms to pass), others benefited from seeking help from the supports around them, including their physicians and case managers, or counted on these supports to mobilize help for them (Ball, Links, Strike, & Boydell, 2005).

This paper attempts to build on the findings of Ball et al. (2005) and contribute new knowledge to the field by exploring the possible effects of two intensive community mental health programs, an ACT program and an ICM program, on the suicidal ideation and suicidal behaviours of individuals with serious mental illnesses in an inner city setting. Although both ACT and ICM are designed to provide intensive contact with clients and therefore facilitate help-seeking behaviours or help-mobilizing activities during crises, ACT standards more clearly identify program structures that enable case managers to respond to client crises 24 hours per day than is the case with ICM.

The present study attempts to answer the following questions: Do ACT clients with severe and persistent mental illnesses experience a greater reduction in suicidal ideation and behaviours than similar clients receiving an ICM model of care? What are the program structures and characteristics of ACT and ICM that may assist with suicide prevention and intervention in this population?

METHOD

Forty individuals were randomized to the experimental arm (the ACT program) of the study and 40 individuals were randomized to the control arm (the ICM program). Individuals interviewed in the qualitative study cited (Ball et al., 2005) represented a subset of this sample. Both programs were part of St. Michael's Hospital Mental Health Service – Inner City Health Program, in downtown Toronto. The study protocol received ethics approval from the Research Ethics Board of St. Michael's Hospital and the University of Toronto. The ACT program had been implemented according to the Ontario Ministry of Health and Long-Term Care standards for ACT teams (Gallow, 1997; Sapsford, 1998) and therefore closely resembled ACT programs reported in the literature (Gehrs et al., 2004). The ICM program was unique in that it had formed a partnership with the Toronto Community Care Access Centre, a home care program that was able to enhance ICM services with the addition of nursing services contracted to St. Elizabeth Health Care and personal care support services contracted to the Visiting Homemakers Association. Visiting nursing services included medication administration and general health monitoring. Personal support services included assistance with activities of daily living.

To be eligible for referral to the study, individuals had to have been diagnosed with a DSM-IV Axis I disorder (identified in previous medical records and confirmed by a study psychiatrist); be between the ages of 18 and 65; have lived with serious mental illness for at least 5 years; have made significant use of formal mental health services as defined by two or more psychiatric hospitalizations, more than 100 days in hospital, or more than nine visits to the crisis team or emergency departments in the past 18 months; have impaired social functioning as defined by a score of less than 60 on the Multnomah Community Ability Scale (Barker, Barron, McFarland, & Bigelow, 1994; Barker, Barron, McFarland, Bigelow, & Carnahan, 1994); and be capable of providing informed consent. Those with a DSM-IV Axis II disorder only, a substance use disorder only, a developmental disability, signs of dementia, or who posed a potential danger to case managers were excluded from the study.

Study clients were individuals with severe and persistent mental illness referred to the St. Michael's Hospital Mental Health Service from inpatient services and community agencies in downtown Toronto. All referral sources were informed of the nature of the study, the inclusion and exclusion criteria, and the need for competency with respect to participation. All referred individuals were interviewed by a psychiatrist to confirm their diagnosis and eligibility for the study, and their capacity to understand the nature and purpose of the study and to give informed consent. Eligible participants were randomly assigned to the experimental (ACT) or control (ICM) group. The random assignment schedule was determined by a statistical consultant. The initial assignment consisted of the first 20 participants, with 10 assigned to each group. A research assistant blinded to the treatment then analyzed the inclusion criteria to determine whether significant differences existed between the groups. If significant differences were found, the consultant determined the variance between samples and the bias necessary to assign the next 20 participants to equate the groups in terms of the inclusion criteria. The sequence continued until all 80 individuals were assigned to the two groups. This procedure helped to ensure that the experimental and control samples were as similar as possible.

Capacity was assessed with reference to the ability to understand the nature of the study in accordance with the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans*

(Canadian Institutes of Health Research et al., 1998). Individuals who were not capable of giving consent were not admitted to the study. Their treatment needs were assessed by the St. Michael's Hospital community mental health referral triage committee, and they were assigned to the appropriate treatment team. For example, individuals who were not capable but required high intensity of service were referred to the ACT team. Individuals who later decided to withdraw from the study were offered the opportunity to continue with their current treatment. Individuals who dropped out of the study within the first 9 months were replaced. For individuals who dropped out after 9 months, the data from the 9-month interviews were brought forward to the 18-month end point in an intention-to-treat analysis.

Study clients underwent comprehensive interviews at baseline and were reinterviewed 9 and 18 months later. Although the research assistants were not blind to the treatment protocols, they received training including assessment of interrater reliability for the assessment tools. The research assistants received regular supervision from the principal investigator and co-investigators of the study.

Suicide ideation and suicidal behaviours were measured using the Modified Scale for Suicide Ideation (Miller, Norman, Bishop, & Dow, 1986), which is based on the Scale for Suicide Ideation (Beck, Kovacs, & Weissman, 1979). The instrument is an 18-point scale. The first four items are designated as screening tools to identify individuals whose suicidal intent was severe enough to warrant administration of the entire scale. If the answers to these items were either 0 (none) or 1 (weak), the remainder of the questions were not asked. Items were probed for the previous 30 days, rather than for the last 48 hours as conceived by the scale developer, in order to broaden the snapshot period that could reasonably be recalled.

Items 1 and 2 of the scale measure suicidal ideation. The two items are conceptually very similar in that Item 1 asks, "Do you want to die now?" and Item 2 asks, "Do you care if you live or die?" Closer analysis revealed that the kappa-statistic for these two items was 86.3% at baseline and 95.3% at 18 months. Each item individually yielded similar results; for simplicity, therefore, rather than use both items, Item 1 was used to indicate whether the individual had suicide ideation. If the individual indicated that he or she "had no current wish to die, hasn't had any thought about wanting to die," the variable was coded as 0, and 1 otherwise.

Items 3 and 4 of the scale measure passive and active suicide attempts. A variable was created using these items to indicate whether the study participant had made either an active or a passive suicide attempt. This indicator variable was used to capture suicidal behaviours. It was coded 0 if the answers to both Items 3 and 4 were 0, and 1 otherwise. Active suicide attempts were defined as acts that directly lead to death. Passive suicide attempts were defined as not taking actions that may prevent death, such as failing to seek or refusing treatment for a medical emergency. A specific example would be an individual with insulin-dependent diabetes who refuses insulin.

In order to gain more insight into the specific ACT and ICM program structures and characteristics that provided crisis support and suicide intervention to the individuals in the study, the Dartmouth Assertive Community Treatment Scale (DACTS) was applied to both programs roughly halfway through the recruitment phase. Scoring was guided by the DACTS Protocol for Assertive Community Treatment Scale (Schaele et al., 2002). The DACTS score sheets for both programs were completed by an independent rater (member of the research team). To ensure proper administration of the DACTS, one

of the research assistants contacted the instrument author (G. Teague) directly and obtained a step-by-step instruction manual. The process required to complete the score sheets included a combination of interviews with the program managers and reviews of clients' charts and program documents. Score sheets were used to rate 28 program characteristics related to three criteria: "Human Resources" (e.g., caseload size; availability of nurses, psychiatrists, and addictions specialists on the team); "Organizational Boundaries" (e.g., responsibility for crisis services, responsibility for hospital admissions and discharges, full responsibility for treatment services); and "Nature of Services" (e.g., assertive engagement, intensity of service, frequency of contact). Each item was rated on a scale of 1 to 5, with a score of 5 being the maximum score on the DACTS.

Finally, a chart review of 2 randomly chosen months of service looked at the on-call after-hours pager use of ACT program clients. Calls to the pager with suicidality concerns were tracked in the database to determine how and when the crises were resolved.

RESULTS

Chi-square tests and *t*-tests on key demographics and on medical and psychiatric characteristics were used to evaluate whether the randomization scheme produced equivalent groups at baseline. To examine the differences in suicidal ideation as well as passive and active suicide attempts among the study participants, we estimated the proportion of the participants in each program who endorsed these questions at baseline and 18 months later, and constructed 95% confidence intervals. With small cell sizes, Fisher's exact tests were used to test between group and within group differences with respect to suicidal ideation and behaviours. A Bonferroni correction was used such that $p < .0125$ was considered statistically significant.

In order to answer the question concerning program structures and characteristics, researchers compared DACTS scores for the ACT program, the ICM program, and the ICM program plus its home-care partnership for all 28 items relating to Human Resources, Organizational Boundaries, and Nature of Services characteristics.

In total, 80 individuals were randomized to the experimental and control arms. Five withdrew from the ICM program during the first 9 months of the study and were replaced before the 9-month follow-up interview, resulting in an equal number of participants for follow-up in both the ACT and ICM programs ($n = 40$). Between 9 and 18 months, 1 participant dropped out of the ACT arm of the study, and 7 withdrew from the ICM arm. Randomization of clients was successful in that there were no significant differences between ACT and ICM clients with regard to age, education, gender, race, marital status, and primary psychiatric diagnosis (see Table 1). For example, 88% of clients in both programs had a primary diagnosis of schizophrenia.

Figure 1 shows estimates of suicidal ideation as indicated by responses to Item 1 of the Modified Scale for Suicide Ideation among study participants by program and time. The estimates and 95% confidence intervals indicate that the ICM and ACT groups do not significantly differ at baseline according to the results of Fisher's exact test, $p = .622$. However, at 18 months, the results of Fisher's exact test indicate a significant difference, $p < .001$, between ICM and ACT: the proportion of suicidal

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Table 1
Baseline Demographics of ACT and ICM Clients

Characteristic	ACT		ICM		Analysis <i>p</i>
	Mean	<i>SD</i>	Mean	<i>SD</i>	
Age	39.3	9.4	40.8	11.0	.51
Education (yrs)	11.9	2.9	12.8	13.9	.21
	<i>n</i>	%	<i>n</i>	%	
Gender (male)	31	78	28	70	.61
Race					.47
White	18	46	22	56	
Black	8	19	7	18	
Asian	6	14	1	3	
Other	9	23	9	23	
Marital status					.83
Single	29	73	31	78	
Married ^a	3	8	2	5	
Separated	8	20	7	18	
Primary diagnosis					1.00
Schizophrenia	33	88	33	88	
Mood disorder	10	27	10	27	
Personality disorder	4	10	4	10	
Developmental delay	1	3	0	0	
Substance-related	3	8	4	8	

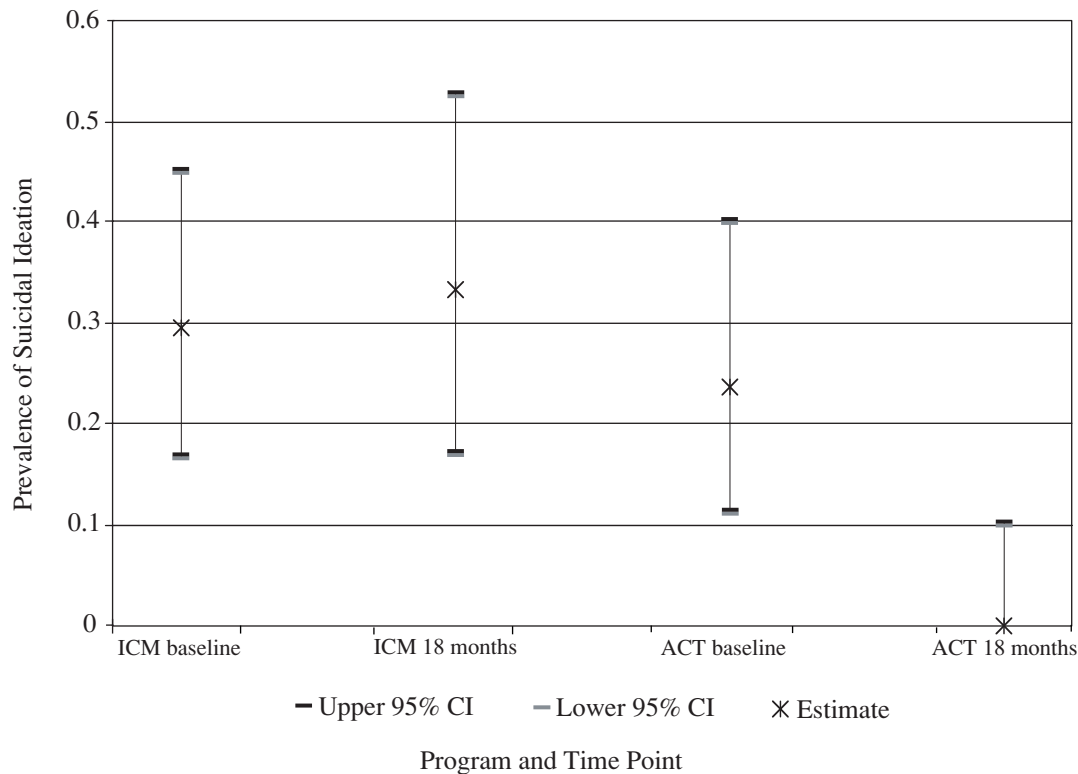
Note. ACT = Assertive Community Treatment. ICM = Intensive Care Management. SD = standard deviation.

^aIncludes common-law unions.

ideation among ACT participants is lower. There is no significant difference between the baseline and 18-month measures for the ICM group, $p = .801$. In contrast, for the ACT group there is a significant difference between the baseline and 18-month measures, $p = .003$, with a lower proportion of suicidal ideation at 18 months.

The estimates and 95% confidence intervals of suicidal behaviours among study participants in each program by time indicate that the ICM and ACT groups do not significantly differ at baseline according to the results of the Fisher's exact test, $p = .269$. There is no significant difference between the baseline and 18-month measures for the ICM group ($p = .372$) or for the ACT group ($p = .056$). Nor is there a statistically significant difference between the ACT group's 18-month estimate and that of the ICM group.

Figure 1
Proportion of Individuals with Suicidal Ideation by Program and Time



Note. ACT = Assertive Community Treatment. ICM = Intensive Care Management. CI = confidence interval.

DACTS scores for the three dimensions—Human Resources, Organizational Boundaries, and Nature of Services—were analyzed to determine the major similarities and differences in the ACT and ICM program structures that may facilitate crisis support (see Table 2). In the Human Resources dimension, both programs scored equally well in meeting ACT best practice ideals (i.e., a score of 5) in relation to having small caseloads and using a team approach—when the home-care partnership services were factored in as part of the ICM team. Both programs also scored 5 in implementing ACT best practices for the provision of nursing services to clients. The ACT program, however, scored higher on access to specialized team members, such as a substance abuse specialist, a vocational specialist and, in particular, a psychiatrist. Whereas the ACT team scored 5 for access to psychiatric services, the ICM program scored 2.

With regard to the Organizational Boundaries dimension, the DACTS scores for the ACT program were higher than those for the ICM program in terms of responsibility for crisis services, hospital admissions, and hospital discharge planning (the ACT program scored 5 while the ICM program scored

Table 2
DACTS 28-Item Score for the ACT and ICM Programs

Criteria	ACT	ICM only	ICM +
Human Resources			
Small caseload	5	4	5
Team approach	5	3	5
Program meeting	4	3	3
Practicing team leader	1	5	5
Continuity of staffing	4	4	4
Staff capacity	5	5	5
Psychiatrist on staff	5	2	2
Nurse on staff	5	5	5
Substance abuse specialist on staff	5	1	1
Vocational specialist	4	1	1
Program size	5	3	4
Mean	4.3	3.27	3.64
Organizational Boundaries			
Explicit admission criteria	5	5	5
Intake rate	5	5	5
Full responsibility for treatment services	5	3	4
Responsibility for crisis services	5	1	2
Responsibility for hospital admissions	5	2	2
Responsibility for hospital discharge planning	5	2	2
Time-unlimited services	5	3	3
Mean	5.00	3.00	3.28
Nature of Services			
Community-based	5	5	5
No dropout policy	5	4	4
Assertive engagement	5	4	4
Intensity of service	4	2	4
Frequency of contact	3	1	5
Work with informal supports	3	3	3
Individualized substance abuse	4	3	3
Dual disorder treatment groups	2	1	1
Dual disorders model	5	5	5
Role of consumers	3	2	2
Mean	3.9	3.0	3.6
Mean total	4.42	3.09	3.51

Note. DACTS = Dartmouth Assertive Community Treatment Scale. ACT = Assertive Community Treatment. ICM = Intensive Care Management.

2 on all three criteria). The higher ACT scores were due to the fact that the program provided an on-call pager service to clients 24 hours per day, 7 days per week. ICM clients did not have access to an on-call pager designated for crises.

The chart review of 2 randomly chosen months of service revealed that clients of the ACT team were heavy users of the on-call pager. ACT team members documented an average of approximately 30 crises per month that were resolved after hours (i.e., between 8 p.m. and 8 a.m. during weekdays and between 9 p.m. and 9 a.m. on weekends). ACT clients typically called the on-call pager because they were feeling frightened due to paranoia or other psychotic symptoms, or were feeling stressed, agitated or lonely. Although specific suicidal ideation was not recorded in the 2-month period, the chart review showed clear evidence that clients were severely distressed. The after-hours contact with an ACT team member appeared to be helpful in resolving crises and in assessing the immediate risk. Often, a team member talked the individual through the crisis, offered reassurance, and helped the client put a plan of action in place for that night and the next day. When necessary, the ACT team was also able to facilitate admission to the hospital's inpatient unit during crises. The ACT team psychiatrists maintained responsibility for providing inpatient care to their clients and together with other ACT team members engaged in discharge planning when individuals were ready to leave the hospital. In this way the ACT team provided continuity of care before, during, and after a crisis.

In addition to not having access to an on-call pager, clients of the ICM program who were admitted to hospital received care and discharge planning from an inpatient team rather than from program providers. Therefore, the ICM psychiatrist and case managers faced additional challenges in maintaining continuity of care across the crisis episode.

An analysis of the Nature of Services scores indicates that both programs scored high (scores of 5) with respect to community-based focus, which means that services were primarily delivered in clients' homes or in other relevant community settings. Although the ACT program was slightly more assertive in its outreach and more rigorous in implementing a no dropout policy (scores of 5 versus 4 for ICM), the ICM program actually scored higher for frequency of contact when the visits of home-care staff were included in the analysis (5 versus 3 for ACT). Through a team effort by the visiting nurses, personal support workers, and the ICM case managers, the ICM clients were able to receive much more frequent visits from their care providers than were the ACT clients. Intensity of service—that is, the actual time spent visiting clients—was about the same for both programs (scores of 4).

DISCUSSION

The findings suggest that there were no significant changes in suicidal behaviour over 18 months with either intervention. However, the ACT intervention demonstrated a significant decrease in the prevalence of suicidal ideation over the 18-month period. In addition, the prevalence of suicidal ideation was significantly lower at 18 months among ACT clients than among ICM clients. These results raise some interesting points for discussion.

An analysis of the DACTS scores for program structures offers some insights into the therapeutic processes associated with each program design. For example, both programs followed ACT best prac-

tice guidelines for caseload size and team approach. Because of these program elements, clinicians were able to get to know their clients well, and clients had a network of support workers, instead of a single clinician, to monitor them in the community. The strength of these relationships and the size of the network may be important in encouraging help-seeking behaviours by clients and in mobilizing support when a crisis is emerging. This finding supports that of Ball et al. (2005), who saw the promotion of help-seeking behaviours in clients and help-mobilizing activities by third party providers as critical elements in resolving crises in this population.

Secondly, the importance of specialized support to manage illness symptoms in this population cannot be overlooked. Although it is important to recognize the social and interpersonal factors that may lead to crises—individuals with serious mental illness living in the inner city do indeed encounter many social factors that affect their quality of life—the personal accounts of clients interviewed by Ball et al. (2005) indicate that their crisis situations were very closely associated with exacerbation of illness symptoms. Although both programs in our study offered a high degree of nursing support to ensure that medications were administered regularly and adherence was carefully monitored, the ACT program had the added advantage that psychiatrist support was much more accessible to clients than it was in the ICM program. The clients interviewed by Ball et al. (2005) indicated further that taking the initiative to see their doctor or being prompted to see their doctor so that the right medications could be prescribed were key responses leading to crisis resolution. Having the right medication helped individuals to manage better on their own; they were better able to sleep and feel safe until the symptoms subsided and the crisis resolved. It is therefore possible that suicidal ideation in ACT clients was indirectly alleviated by a more proactive monitoring of illness symptoms by the psychiatrists overall.

The ability of a program to respond to crisis episodes is another important point for discussion. As has already been identified, the ACT program provided additional support for its clients through a 24-hour crisis pager. This program element encouraged potentially suicidal clients to actively seek help, day or night, by problem-solving with a trusted clinician over the telephone. ACT services may reduce suicidality because of ready access to clinical supports around the clock. The ACT program also engaged in other practices that may have reduced the risk of suicide among clients. In particular, physicians with the ACT program maintained responsibility for client care when the person was hospitalized. Having responsibility for inpatient care gave the physicians more control over the treatment of illness symptoms and discharge planning. They could ensure that clients were discharged safely. Because the physicians knew these clients well, they may have had a clearer understanding of the wellness baseline for individuals, and what level of suicide risk could be tolerated in the community.

Although the ICM program did not integrate a 24-hour on-call pager and responsibility for inpatient care into their model of care, this program may have inadvertently used a different strategy in managing suicidality. Due to the service partnership with the home care program, the ICM clients received a very high frequency of visits, which may have served as a protective factor for them. These clients reported that the kind of crisis caused them to feel low, depressed, and eventually suicidal had a much slower onset than other kinds of crises (Ball et al., 2005). It is possible that frequent visits and monitoring by the team of ICM case managers, nurses, and personal support workers may have assisted in detecting this type of crisis as it emerged, before clients needed to call a 24-hour crisis support pager.

One of the limitations of this study relates to the small sample size. It would have been ideal to use statistical methods such as generalized estimating equations in which we could have taken advantage of the longitudinal nature of the data to examine the association between suicidal behaviour and the interaction between the program and time period, controlling for potentially confounding variables (e.g., age, sex, therapeutic adherence). The small sample size and the fact that all values at 18 months for the ACT group were “0” prohibited this. The fact that at 18 months none of the ACT clients had suicidal behaviours meant there was no way to characterize variation in suicidal behaviour among ACT clients, which limited the usefulness of a regression model. Future work could be directed at collecting a larger sample that would allow for more advanced statistical methods to examine whether the results hold.

A second limitation involves the missing values. At the 18-month follow-up, the indicator of suicidal behaviour was missing for 23 individuals. Most of these individuals ($n = 16$) were from the ICM program. If the missing values for these individuals were associated with their treatment by ICM, our results may be biased. For example, if ICM was related to suicidal behaviour and suicidal behaviour was responsible for this missing data, we would underreport suicidal behaviour among ICM clients. However, it should be noted that when differences with respect to demographic characteristics and treatment adherence were tested, we could not reject the null hypothesis that these individuals were similar to those for whom the indicator was not missing. This suggests that the group for whom data are missing is not different from the group for whom data are available. Thus, we assume that the people with missing data do not differ in a systematic way (e.g., suicidal behaviour).

Finally, it may be difficult to generalize the results of this study to all ACT and ICM clients. Only those clients who were competent to give consent were included in this study. ACT and ICM populations also include individuals whose care is directed by a substitute decision maker, and the outcomes of this subgroup are unknown. Also, it is recognized that the ICM program included in this study was different than most ICM programs, in that services were substantially enhanced through a partnership with home care. It may be difficult to generalize the results to other ICM programs.

This study helps researchers and community mental health planners begin to evaluate the possible benefits of ACT and ICM models in supporting high-risk individuals with serious mental illness. Further studies with larger sample sizes and longer follow-up periods are now needed to replicate these findings. Of particular interest would be a more in-depth study of the impact of 24-hour on-call support and increased access to psychiatrist services across the crisis continuum on the experiences of suicidal clients with serious mental illness. Further research is required to determine the right frequency of monitoring and medical support to ensure that programs can remain fiscally responsible, yet offer best practice services in managing suicidal risk.

RÉSUMÉ

Le but de cette étude était d'évaluer l'effet sur la suicidalité des clients et clientes souffrant d'une maladie mentale grave de 2 programmes intensifs de santé mentale communautaire. Quarante-vingts personnes souffrant d'une maladie mentale grave et persistante ont été inscrites à une étude

contrôlée et avec répartition aléatoire visant à comparer 2 modèles de programme de suivi intensif, soit le suivi intensif en équipe dans la communauté (*Assertive Community Treatment*) et la gestion intensive des cas (*Intensive Case Management*). Les idées et comportements suicidaires ont été évalués au moyen de l'échelle modifiée des idées suicidaires (*Modified Scale for Suicide Ideation*). Les sujets de l'étude ont subi des entrevues détaillées au départ puis 9 et 18 mois plus tard. L'échelle *Dartmouth Assertive Community Treatment Scale* (DACTS) a été appliquée aux 2 programmes afin d'obtenir plus de détails sur les aspects et les caractéristiques des programmes de suivi intensif en équipe dans la communauté et de gestion intensive des cas qui sont axés sur le soutien en cas de crise et la prévention du suicide. Un examen des dossiers sur 2 mois de services choisis au hasard a porté sur l'utilisation par les clients et clientes du programme de suivi intensif en équipe dans la communauté du numéro de téléavertisseur après les heures normales de bureau. La prévalence des idées suicidaires était significativement plus basse après 18 mois chez les clients et clientes du programme de suivi intensif en équipe dans la communauté que chez ceux et celles du programme de gestion intensive des cas. Cette étude est la première qui donne à penser que les programmes de suivi intensif en équipe dans la communauté peuvent avoir certains avantages supplémentaires pour ce qui est de la réduction de la suicidalité chez les personnes souffrant d'une maladie mentale grave et persistante.

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