

Assertive Community Treatment (ACT) in Singapore: A 1-year Follow-up Study

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Abstract

Introduction: Assertive Community Treatment (ACT) provides community-based treatment to patients with severe and persistent psychiatric illnesses, so that they may continue to live and function in the community as they receive psychiatric care. This study aimed to examine the effects of ACT on the outcome of patients over a 1-year period in an Asian population. **Materials and Methods:** This naturalistic and retrospective cohort study examined the effects of ACT on 100 patients who had completed 1 year of ACT. Parameters used to measure primary outcome were i) number of admissions (NOA) and ii) total length of stay (LOS) in days. Secondary outcome compared the employment status of patients before and after ACT. Paired sample analyses were performed using SPSS. **Results and Discussion:** The mean reduction in NOA 1 year post-ACT was 57.1%. The mean reduction in LOS 1 year post-ACT was 61.9%. The median reduction for NOA and LOS were both statistically significant ($P < 0.01$). Thirty-seven patients were employed compared to 6 before the programme, a statistically significant effect on employment (odds ratio 9.69, $P < 0.01$). **Conclusions:** ACT appears effective in reducing the frequency and duration of admissions for patients in Singapore. The employment status of patients also showed improvement over the course of study.

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Introduction

Major mental illnesses can be persistent and debilitating, significantly impairing patients' social, occupational and daily functions. The Global Burden of Disease lists schizophrenia among the top 10 contributors to health burden and disability around the world.¹

The Assertive Community Treatment (ACT) programme or assertive outreach model associated with developments in Madison, Wisconsin has been one of the most important approaches in community psychiatry.^{2,3}

ACT provides a comprehensive range of treatment, rehabilitation and support services through a multidisciplinary team based in the community. Basic characteristics of ACT programmes include assertive engagement, in vivo delivery of services, an integrated team approach, staff continuity and responsibility, caseloads with high staff-to-patient ratios and brief but frequent contacts.⁴

The ACT approach has been widely adopted across the world. Evaluations where conducted often conclude that the approach can improve the outcome of patients.⁵ Many have shown ACT to be effective in reducing the number of

days spent in psychiatric hospitals in different communities.⁶⁻⁸ Studies have also shown ACT to be cost-effective.^{9,10} In the UK, ACT has been implemented nationally as part of their mental health policy.^{11,12}

The Institute of Mental Health (IMH) launched its ACT programme on 1 November 2003. The ACT team comprises a psychiatrist, a medical officer, a medical social worker, 6 community psychiatric nurses and an occupational therapist. This multidisciplinary team is mobile and provides its services at the patient's place of residence, with focus on treatment monitoring, rehabilitation and social support.¹³

To the best of the authors' knowledge, no studies have been carried out in an Asian setting. This study aimed to examine the effects of ACT on the outcome of patients over a 1-year period in Singapore.

Materials and Methods

The goals of ACT are to minimise or prevent recurrent relapses of the illness, reduce hospital readmissions, improve self-care and skills for independent living, enhance quality of life and lessen caregiver burden.

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Admission Criteria for the Assertive Community Treatment Programme

Based on the aims and principles of ACT, the following admission criteria have been drawn up for the ACT programme:

1. Individuals aged 18 to 65 years.
2. Patients of the Institute of Mental Health.
3. Severe and persistent mental illness such as schizophrenia, delusional disorder and manic-depressive psychosis.
4. Presence of severe symptoms and impairment that produce distress and major disability in daily functioning.
5. Significant disability caused by severe mental illnesses that is not helped by the traditional outpatient management model.
6. Three or more admissions in the past year (hospital readmission rate is a key outcome measure and will be discussed later).

Notably, the presence of comorbid conditions, e.g., substance abuse, depression and anxiety disorders will not exclude patients from the programme. Patients may be referred to ACT by either the principal (outpatient) psychiatrist or the attending (inpatient) psychiatrist. The ACT team will review each referral and decide whether to accept the patient.

Patients with organic brain disorders, primary alcohol/substance abuse problems, residents in long-stay institutions and those who are homeless are excluded from the ACT programme. This ensures that only patients with disabilities resulting from severe mental illnesses, and patients who have the basic resources to remain in the community (i.e., not homeless) are accepted. Patients who are homeless are referred to the hospital medical social worker for assistance.

Discharge Criteria

Patients may be discharged after a suitable time period under any of the following circumstances, upon mutual agreement between the patients and the ACT team:

1. Patients who demonstrate an ability to function in all major role areas (self-care, social and occupational).
2. Patients' request for discharge, despite the team's best efforts to develop an acceptable rehabilitation plan.

Outcome Measures

In this study, outcomes chosen were objective and comparable, as in previous studies on ACT. Primary outcome was measured using i) number of admissions (NOA) and ii) total length of stay in days (LOS) 1 year pre-ACT and 1 year post-ACT. Data for admissions and duration of inpatient stay were obtained from patients' medical records and official inpatient registers.

Secondary outcome examined the employment status of patients. Patients with any form of employment, including part-time and full-time work, were considered employed while homemakers and those with no work were considered unemployed. Data were obtained at the point of entry into ACT and 1 year post-ACT via direct interviews.

To assess differences in outcome, paired sample analyses comparing pre-ACT and post-ACT were performed using SPSS. Non-parametric tests were used due to the non-normal distribution of data. The median was tested for statistical significance using the Wilcoxon signed ranks test. For employment status, the McNemar test was utilised.

Results

Baseline Data

From November 2003 to December 2005, 100 patients who had completed 1 year of ACT were included in this study. All patients were referred by their attending psychiatrists at IMH.

The baseline patient data obtained at the start of ACT is shown in Table 1. The diagnoses of patients over the 1-year study remained unchanged.

The demographic distribution of patients largely represents Singapore's general population of 76.8% Chinese, 13.9% Malays, 7.9% Indians and an even sex ratio of approximately 1:1.¹⁴

Main Outcome

Table 2 shows the primary outcomes of the study.

Table 1. Baseline Characteristics of Patients

Demographics/Baseline	(n = 100)
Age (y)	
Mean (SD)	42.0 (9.9)
Gender	
Male (%)	46
Female (%)	54
Race	
Chinese (%)	82
Malay (%)	12
Indian and Others (%)	6
Diagnosis*	
Schizophrenia (%)	86
Schizoaffective disorder (%)	9
Manic-depressive psychosis and others (%)	5
Length of illness (y)	
Mean (SD)	13.7 (9.8)

SD: standard deviation

* Diagnosis based on the main categories listed on the ACT referral form.

Table 2. Primary Outcomes

	Pre-ACT (n = 100)	Post-ACT (n = 100)	df (P value)
NOA			
Mean NOA (SD)	2.67 (1.54)	1.26 (1.72)	
Mean % reduction in NOA		57.1%	
Median (interquartile range)	2.0 (2.0-3.0)	0.5 (0.0-2.0)	
Median reduction in NOA (95% CI)		1.0 (1.0-2.0)	99 (<0.01)
LOS (days)			
Mean LOS (SD)	94.84 (74.39)	23.68 (36.94)	
Mean % reduction in LOS		61.9%	
Median (interquartile range)	77.5 (42.5-130.5)	4.0 (0.0-34.3)	
Median reduction in LOS (95% CI)		54.0 (37.0-74.8)	99 (<0.01)

95% CI: 95% confidence interval; ACT: Assertive Community Treatment; LOS: length of stay; NOA: number of admissions; SD: standard deviation

Table 3. Secondary Outcome

		Post-ACT		Total
		Employed	Not employed	
Pre-ACT	Employed	5	1	6
	Not employed	32	62	94
Total		37	63	100

ACT: Assertive Community Treatment
df = 1; $P < 0.01$; odds ratio, 9.69; 95% CI, 1.09 to 86.47

The median reduction for number of admissions (NOA) and length of stay (LOS) were both statistically significant ($P < 0.01$). Calculations of 95% confidence intervals (CIs) for the median differences in NOA and LOS were based on 2000 bootstrap replicates. Analysis of continuous variables was not done as the study was self-controlled and diagnoses were unchanged during the course of study.

Table 3 shows the secondary outcome of employment. After 1 year, there was a statistically significant six-fold increase in gainful employment. Employment status was assessed in a cross-sectional manner. Homemakers were considered unemployed in this study to avoid over-reporting of employed status.

Discussion

Since the 1950s, the care of mentally ill patients has been gradually shifting from mental state hospitals to the community. The move to community care emphasises improving quality of life, destigmatising mental illness and promoting self-sufficiency, hence the inception of ACT in 1972, Wisconsin. Systematic reviews and meta-analysis studies that followed have shown ACT to be effective in reducing hospitalisation among high users of inpatient services.¹⁵⁻¹⁸ Patients in our study had severe, persistent mental illness that averaged over a decade in chronicity.

The vast majority was diagnosed with schizophrenia, a condition often characterised by multiple relapses and readmissions over the course of illness. Medical records reviewed found that our patients had consistently required hospitalisation for relapses in the 2 to 3 years prior to ACT. Our study showed reductions in both the frequency and duration of hospital admissions 1-year post-ACT.

This can be attributed to the multidisciplinary team approach in improving patient's self-care, independent-living skills, symptom control and quality of life through smaller caseloads, better staff-to-patient ratio and more frequent contacts. Preliminary results using standardised instruments such as the SF-36 health survey and brief psychiatric rating scale have shown promising findings.

The positive employment outcome resulted from the intensive occupational therapy available to our patients as well as the active sourcing of employment by our social workers.

In addition, much effort was put into involving the patient's family and caregivers to strengthen compliance to both medication and outpatient follow-up. The team was also able to respond and deal with crisis situations more quickly and thus prevent unnecessary admissions.

Some critics have argued that reduced hospitalisation is not the result of ACT but simply administrative decisions to treat all ACT patients in the community regardless of symptoms and severity, while patients in the control group were not subjected to such a rule and therefore hospitalised more frequently.¹⁹ In our study, such a rule was not imposed and the criteria for hospitalisation remained unchanged.

A recent study comparing recipients of ACT and those receiving regular care from community mental health teams found no evidence of greater clinical efficacy or

improvement in social outcomes.²⁰ However, in our local context, we do not have distinct community mental health teams for comparison and this model can thus be further explored.

Limitations

This was a naturalistic and retrospective cohort study comparing patients pre-ACT and post-ACT. A randomised controlled trial would be a better measure of ACT effectiveness.

Patients discharged from the programme before 1 year were not included in this study. This could have led to selection bias as those discharged prematurely could have comprised more severe cases. Conversely, patients who improved may have dropped out earlier as they no longer needed assistance. In this study, 23 patients were excluded. Fourteen were placed in long-stay institutionalised care, 2 were remanded by the courts, 1 was not contactable and 6 refused further ACT intervention.

Although patients in the study were from IMH, admissions to other hospitals during the period of study were not captured. These may be potentially confounding but they are not common and if any, the effect would probably be small.

Comparing the number of man-hours and frequency of visits by the ACT team may have helped determine if treatment intensity affected improvement. More details on the working status such as the number of working hours and duration of sustained work would have reflected occupational function more accurately.

Conclusions

Our findings are consistent with previous studies on ACT, showing not only a significant reduction in psychiatric hospital use but also a marked increase in gainful employment. The impact of ACT will certainly have an important bearing on the future of mental health and de-institutionalisation in Singapore.

Research is still in progress, with additional outcome measures added to assess the patients' clinical status, client satisfaction, quality of life, social functioning, suicide rates and involvement with the criminal justice system.

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