Clinical case management for patients with schizophrenia with high care needs

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Abstract

The aim of this study is to establish the effectiveness of a clinical case management (CM) programme compared to a standard treatment programme (STP) in patients with schizophrenia. Patients for the CM programme were consecutively selected among patients in the STP with schizophrenia who had poor functioning. Seventy-five patients were admitted to the CM programme and were matched to 75 patients in the STP. Patients were evaluated at baseline and at one year follow-up. At baseline, patients in the CM programme showed lower levels of clinical and psychosocial functioning and more care needs than patients in the STP. Both treatment programmes were effective in maintaining contact with services but the CM programme did not show advantages over the STP on outcomes. Differences between groups at baseline may be masking the effects of CM at one year follow-up. A longer follow-up may be required to evaluate the real CM practices effects.

Key words. Case management; Severe mental disorder; Schizophrenia; Quasi-experiment

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Introduction

Case Management (CM) is one of the main components of the services for persons with severe mental disorders (SMDs). Although CM was initially defined as a way of coordinating resources for a patient, nowadays, case manager activities are broader and usually include the direct provision of services (Mueser, Bond, Drake, and Resnick, 1998). CM is successful in community-based models (Marshall, Gray, Lockwood, and Green, 2000; Mueser *et al.*, 1998; Van Os, 2009; Ziguras and Suart, 2000) in outcomes such as treatment compliance, hospital admissions, satisfaction and quality of life.

In Spain, where mental health care is community-based, CM has proven to be cost-effective in decreasing the burden of schizophrenia (Gutiérrez-Recacha, Chisholm, Haro Abad, Salvador-Carulla, and Ayuso-Mateos, 2006) and use of services (Alonso Suárez *et al.*, 2011). In Catalonia, a Spanish autonomous community, a new model of mental health care was developed during the transition to democracy. It led to a public mental health network integrated into the national health system, organised into health care sectors and based on Adult Mental Health Centres (AMHCs) and hospitals and community rehabilitation centres. AMHCs consist of multidisciplinary teams (psychiatrists, psychologists, nurses and social workers) that offer outpatient and specialist care for mental disorders through programmes and interventions included in their care services during office hours. Since their establishment, AMHCs offer care to patients with SMDs through a Standard Treatment Program (STP) that includes: 1) general clinical and psychosocial assessments; and 2) medical interventions and follow-ups.

In 1997, the Health Department of Catalonia developed a specific type of CM programme for patients with SMDs that requires a higher level of care and other resources in addition to those in the STP. Its elements are those described by Ruggeri and Tansella (2008) and it meets the criteria of a clinical CM model by offering direct provision of care, and of a non-intensive CM programme since the caseload size is over 20 patients (Dieterich, Irving, Park, and Marshall, 2010). Table 1 shows a detailed description of the STP and the CM programme. All interventions in both programmes follow the Clinical Practice Guideline for Schizophrenia (Working group of the clinical practice guideline for schizophrenia and incipient psychotic disorder, 2009).

Insert here Table 1

Studies on the effects of CM in Spain are scarce, have been conducted without control groups and are restricted to specific outcomes (Alonso Suárez *et al*., 2011; Gutíerrez-Recacha *et al*., 2006). This paper deals with these issues by establishing the effectiveness of a clinical CM programme versus a STP regarding clinical, psychosocial and service use variables.

Methods

A quasi-experimental study, pre-post, two groups, one quasi-control, was used.

Participants

The sample was composed of 150 patients (67.3% males; 75 in the CM programme and 75 in the STP). Seventy percent of patients in both programmes had illness duration longer than 10 years, 66.7% of them had diagnosis of paranoid schizophrenia and their mean age was 41.47 years (SD = 11.80). There were significant differences between the study groups in the type of housing they lived in. A lower percentage of patients in the CM programme reported to live in family-owned housing (See Table 2).

Insert here Table 2

Patients were recruited from December 2006 to January 2008 from 10 AMHCs in Barcelona (Catalonia, Spain). All patients had: 1) diagnosis of schizophrenia according to the International Classification of Diseases-10 or ICD-10 (World Health Organization [WHO], 1995), 2) illness duration greater than 2 years and 3) clinical stability. Patients were excluded if they had dementia, organic brain injury or mental retardation. Patients for the CM programme were consecutively selected among those in the STP visiting the AMHCs with a Global Assessment of Functioning or GAF total score ≤ 50 (Endincott, 1976). Patients in the STP were selected from the AMHC databases through an intentional non-probabilistic sampling among all patients in the STP that could be matched with the patients selected for the CM programme regarding: age ($\pm$ 5 years), gender, illness length ($\pm$ 5 years) and symptoms by the Positive and Negative Syndrome Scale or PANSS (Kay, Friszbein, and Opler, 1987; PANSS total score, $\pm$ 10 points) [PANSS total: CM=87.59, STP=85.87, t=0.851, p=0.396; PANSS positive: CM=17.60, STP=17.08, t=0.669, p=0.504; PANSS negative: CM=25.64, STP=25.15, t=0.537, p=0.592; PANSS general: CM=44.35, STP=43.64, t=0.560, p=0.576].

Instruments

Patients were assessed at baseline and at one year follow-up with these instruments:

The Schizophrenia Cost Evaluation Questionnaire (Haro et al., 1998). It records on the use of health care and social services.

The GAF (Endincott, 1976). This is a valid measure of psychological functioning in persons with SMD included in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association [APA], 1994).

The PANSS (Kay et al., 1987). It assesses symptom severity in persons with schizophrenia. Its validation into Spanish shows good psychometric properties (Peralta and Cuesta, 1994).

The Disability Assessment Schedule short version or DAS-s (Janca et al., 1996). It is a valid and reliable measure of functioning for mental disorders included in the ICD-10 (WHO, 1995) validated in persons with schizophrenia (Mas-Expósito, Amador-Campos, Gómez-Benito, and Lalucat-Jo, 2012a).

The Camberwell Assessment of Needs or CAN (Phelan, Slade, and Thornicroft, 1999). It measures the needs of people with mental illness and shows good psychometric properties in persons with schizophrenia (Rosales, Torres, Del Castillo, Jímenez, and Martínez, 2002).

The World Health Organization Quality of Life Scale Brief Version (WHO, 1993) or WHOQOL-BREF. It is an international, cross-culturally analogous quality of life (QoL) instrument that shows good psychometric properties in persons with schizophrenia (Mas-Expósito, Amador-Campos, Gómez-Benito, and Lalucat-Jo, 2011).

The modified DUKE-UNC Functional Social Support Questionnaire or FSSQ (Broadhead, Gelbach, Degruy, and Kaplan, 1988). It measures the strength of social networks. The Spanish version shows good psychometric properties in primary care patients (Bellón-Saameño, Delgado-Sánchez, de Dios-Luna del Castillo, and Lardelli-Claret, 1996) and in patients with schizophrenia (Mas-Expósito, Amador-Campos, Gómez-Benito, and Lalucat-Jo, 2012b).

Procedure

Each AMHC provided both programmes. The AMHC teams performed patient assessments. For both programmes, the psychiatrists established the diagnosis, following the ICD-10 (WHO, 1995) research diagnosis criteria and considered self and caregiver reports, and assessed psychiatric symptoms. The rest of assessments were performed by the other members of the teams under the psychiatrist's supervision or by a community psychiatric nurse from the teams in the STP. The psychiatrist was responsible for setting up and supervising the assessment agenda and sending the score sheets to the psychologist who designed and analysed the database.

To guarantee quality data, the psychiatrists participated in a schizophrenia diagnostic consensus workshop comprising two case studies. All researchers were trained in the instruments in a 4-hour session run by a psychologist. Systematic reviews of data coding and recording were made and patient information was compared with data from the AMHC responsible for each patient.

Statistical analysis

Clinical and psychosocial outcomes and use of health services were analysed using the Statistical Package for the Social Sciences v. 19. Chi-square analysis and Student's t-tests for independent samples were used for categorical and continuous data, respectively. Mann–Whitney U tests were applied for continuous data to compare independent samples with fewer than 30 patients.

Ethical considerations

The study was approved by the Ethics Committee of the Catalan Union of Hospitals and carried out in accordance with the ethical standards of the 1964 Declaration of Helsinki. The procedures were described to each patient who then provided informed consent.

Results

A total of 69 patients (92%) in the CM programme were successfully followed up. Four individuals (out of 6) had no contact with services, 1 refused to participate and 1 committed suicide. Regarding the STP, 69 patients (92%) were successfully followed up. Six patients had no contact with services. No significant differences between study groups were observed regarding treatment attrition ($\chi^2(1) = 0.000$; $p > 0.05$).

Table 3 shows the differences between the CM programme group and the STP group in clinical and psychosocial variables at baseline and at one year follow-up. At baseline, no significant differences were found between the CM programme and the STP groups in disability, subjective QoL regarding psychological health, social relationships and environment, and perceived social support. However, there were significant differences between groups in patients' needs from the clinician's point of view, clinical and social functioning, subjective QoL regarding physical health and overall QoL (Table 3). Patients in the CM programme group showed more needs, lower clinical and social functioning, and lower subjective QoL regarding physical health and overall QoL compared to patients in the STP. At one year follow-up, there were intergroup differences in social functioning. Patients from the CM group showed poorer social functioning than patients in the STP

Insert here Table 3

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Table 4 shows the use of health services for the CM group and the STP group at baseline and at one year follow-up for categorical variables. At baseline, there were significant differences between the study groups in the proportion of patients that used acute units, overall inpatient hospital services, emergency services and social services. A greater proportion of patients from the CM group used those services. After one year follow-up, there were differences between groups in the proportion of patients who used overall outpatient psychiatric services, community social work services, social services and primary care nursing services. A greater proportion of patients from the CM group used outpatient psychiatric services, community social work services and social services, while a greater proportion of patients from the STP used primary care nursing services.

Insert here Table 4

Table 5 shows the use of health services for the CM group and the STP group at baseline and at one year follow-up for continuous variables. At baseline, there were significant differences between the study groups in outpatient hospital visits, overall outpatient psychiatric hospital visits, community psychiatric visits and community psychiatric nursing visits. Patients in the CM group had more visits to all those services. After one year follow-up, there were differences between the groups in community psychiatric nursing visits. The CM programme group showed higher number of visits to community psychiatric nursing services.

Insert here Table 5

Discussion

This paper aimed to establish the effectiveness of a CM programme versus a STP regarding clinical, psychosocial and service use variables.

Both programmes were effective in maintaining contact with services. Only eight per cent of patients in each programme lost contact with services, which concurs with Marshall *et al*. (2000) with regard to the efficacy of CM and points out favourable effects regarding the STP.

CM did not show any advantage over the STP on the clinical and psychosocial outcomes considered. Therefore, our results seem to coincide with those in a meta analyses conducted by Marshall *et al*. (2000) on the efficacy of CM versus standard care. Namely, the results of this meta analyses showed no benefit of CM over standard care on functioning, quality of life, needs, self-esteem, satisfaction and psychological well-being. Even so, a closer examination of our figures may be pointing out different

conclusions. Throughout the study, it seems there was a tendency to clinical improvement in the CM group, which could be masked because of baseline differences between groups. When we look at needs means in Table 2, we realize that, at one-year follow-up, the CM group reduced its level of needs by about two points while the STP group kept the same baseline level. The same trend is observed on quality of life concerning physical health. As for the rest of variables (i.e. clinical and social functioning and overall quality of life) both treatment programmes seemed to improve but those improvements seemed greater for the CM group. When looking at the results in this way, our findings coincide with those in a meta-analyses on the effectiveness of clinical CM versus usual treatment in clinical functioning (Ziguras and Stuart, 2000) and in other reviews (Mueser et al., 1998). Our results coincide as well with those from other studies (Lichtenberg, Levinson, Sharshevsky, Feldman, and Lachman, 2008) that found improvements in subjective QoL but with a non-validated scale. We used the WHOQOL-BREF (WHO, 1993) which has good psychometric properties in persons with schizophrenia (Mas-Expósito et al., 2011b). To our knowledge, this is the first study conducted in Spain dealing with this relevant outcome (Van Esch, Den Oudsten, and De Vries, 2011). Our results also suggest that CM was associated with decreasing health care needs. Studies are needed to see whether our findings are replicated. It is important highlighting that needs are considered a key component for the recovery of this sample population (Werner, 2012). A longer follow-up period might be required to determine CM effects (Lichtenberg et al., 2008).

CM did not show any advantage over the STP on use of health care services but, even so, it is worth to make some considerations since, again, baseline differences could be masking CM effects. At one year follow-up, most of baseline between-group differences were not present anymore. If we look in detail at the results of Table 4, we realize that there was a reduction by half in the proportion of patients that used inpatient hospital services and emergency services in the CM group. Our results seem to contradict CM studies in other settings where CM is associated with increasing hospitalisation (Marshall et al., 2000; Ziguras and Stuart, 2000). Nevertheless, they concur with Spanish studies about the effectiveness of clinical CM (Alonso Suárez et al., 2011) that show a drop in the number of hospitalised patients which is similar to that observed in our study. Alonso Suárez et al. (2011) also showed a significant decrease in the number of patients visiting emergency rooms. To our knowledge, ours is the second study conducted regarding this outcome. One should also take into account that the STP group also reduced about the same the use of inpatient hospital services and emergency services. Even so, the reduction observed in the

CM group seems enough to decrease differences with the STP at one-year follow-up. Considering that both groups had different levels of clinical stability at baseline, we would like to suggest a longer follow-up to evaluate CM effects at medium or long-term. At follow-up, the CM group still used more social services, which may be associated to their poorer social functioning at both assessment points and there were new differences regarding some health care services. A higher proportion of patients in the CM programme group used overall outpatient hospital services, while a higher proportion of patients in the STP group used primary care nursing services. One possible explanation might be that, after the follow-up, patients were ready to use less intensive services. At baseline, the CM group made more visits to outpatient hospital services, outpatient psychiatric hospital services, community psychiatric services and community psychiatric nursing services. At one year follow up, the CM programme group only showed more community psychiatric nursing visits. There was an increase of visits in the CM programme group not observed in the STP, which coincides with the metanalyses of Ziguras and Stuart (2000) that shows that clinical CM increases contact with services. The increase of such visits in the CM group might have turned into a decrease of outpatient psychiatric hospital service visits. Hospital service use was quite low, which contradicts the hypothesis that CM is effective where hospital bed use is high (Burns *et al.*, 2007) but coincides with other Spanish studies (Alonso Suárez *et al.*, 2011).

Although the aforementioned strengths when comparing our study with other Spanish studies, our results are limited to a one year follow-up. As suggested by some authors (Björkman and Hansson, 2007), certain outcomes regarding CM practices for persons with SMD do not appear in a short-term perspective (i.e. between 6 to 24 months). In addition, we did not used a randomised controlled design but a quasi-experimental design that is considered to be appropriate in clinical and ordinary settings, such as that in this study (Campbell and Stanley, 1966). Further research may consider new components in the CM programme such as an adjunct exercise programme, which has been considered feasible for coping with the high rates of morbidity and mortality in persons with schizophrenia (Sylvia *et al.*, 2012). Other factors that further research may consider when evaluating CM effects is patient perceived criticism. It has been positively associated to higher levels of psychiatric symptoms (Guada, Hoe, Floyd, Barbour and Brekke, 2011).

In summary, the CM group did not show any advantage over the STP group on clinical and psychosocial outcomes and health care service use. The CM group showed lower levels of clinical and social

functioning, and more care needs than the STP group at baseline, which could be masking the results. A longer follow-up is required before drawing conclusions about the effectiveness of those interventions.

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Table 1. Intervention Programme Characterisation

Programme		
	ST	CM
Clinician in charge	Psychiatrist	Psychiatrist
Case manager		Community mental health nurse
Assessment	Global assessment: - Medical aspects: symptoms, clinical functioning, treatment adherence and drug side effects. - Psychosocial assessment: social functioning in general terms	Systematic assessment: - Medical assessment: symptoms, clinical functioning treatment adherence and drug side effects - Psychosocial assessment: social functioning with special emphasis on levels of disability, needs, quality of life and social support.
Therapeutic plan		Development of an individualized therapeutic plan (ITP) - Regularly reviewed and updated (at least every three months) - Modified according to patients' needs
Treatment	Medical intervention : - pharmacological treatment set up	Medical intervention: - pharmacological treatment set up Specific psychosocial interventions: - Psychoeducation: educating patients and families by providing brochures and face-to-face sessions - Family intervention: emphasis on the relationship with the patients' relatives to

mobilize the social network (face-to-face and phone contacts)

- Support in Daily Living: education on the main aspects of personal care
- Crisis interventions and assertive outreach: being in touch with the patient or family in case of an emergency situation (community face-to-face and phone contacts)

Follow-up	Medical follow-up: 4-6 visits at office per year	Medical follow-up: 4-6 visits at office per year
		Nursing follow-up: 12 visits at office per year

ST: Standard Treatment; CM: Case Management

Table 2. Socio-demographic variables according to treatment programme

	Programme				
	CM	ST	Intergroup differences		
Socio-demographic variables	f (%)	f (%)	$\chi 2$	df	p
Male gender	51 (68.0)	50 (66.7)	0.030	1	0.862
Diagnosis of schizophrenia type			0.348	3	0.951
Paranoid	50 (66.7)	50 (66.7)			
Undifferentiated	7 (9.3)	8 (10.7)			
Residual	10 (13.3)	8 (10.7)			
Other	8 (10.7)	9 (12.0)			
Illness duration			0.286	2	0.867
< 5 years	8 (10.7)	7 (9.3)			
From 5 to 10 years	16 (21.3)	14 (18.7)			
> 10 years	51 (68.0)	54 (72.0)			
Marital status					
Single	59 (78.7)	56 (74.4)			
Married or common-law marriage	7 (9.3)	11 (14.7)			
Separated, divorced or widowed	9 (12.0)	8 (10.7)			
Educational level			4.678	3	0.197
Primary school not completed	9 (12.0)	7 (9.3)			
Primary school	26 (34.7)	35 (46.7)			
Secondary school	31 (41.3)	20 (26.7)			
College or university	9 (12.0)	13 (17.3)			
Living situation			5.864	5	0.320
Alone	16 (21.3)	12 (16.0)			

With son/daughter or son/daughter and partner	5 (6.7)	7 (9.3)			
With partner	5 (6.7)	9 (12.0)			
With parents	35 (46.7)	39 (52.0)			
With other relatives	6 (8.0)	6 (8.0)			
With other people or in an institution	8 (10.7)	2 (2.7)			
Type of housing			9.832	2	0.007
Family-owned	43 (57.3)	60 (80.0)			
Rented	21 (28.0)	12 (16.0)			
Hostel, supported sheltered house, therapeutic community, homeless or others	11 (14.7)	3 (4.0)			
Employment status			2.331	3	0.507
Employed/self-employed/ supported employment/student/volunteer	7 (9.3)	13 (17.3)			
House work/on sick leave/retired/unemployed	14 (18.7)	12 (16.0)			
Never worked before	7 (9.3)	5 (6.7)			
Incapacitated	47 (62.7)	45 (60.0)			
	Mean (SD)	Mean (SD)	t		
Age	41.23 (11.98)	41.72 (11.70)	–0.255	148	0.799

Note. n=75 for the case management and the standard treatment programmes

CM: Case Management; ST: Standard Treatment; f: frequency; %: percentage; df: degrees of freedom; SD: Standard Deviation

Table 3. Clinical and psychosocial variables in the case management programme group and the standard treatment programme group at baseline and at one year follow-up

		Programmes			
Measure	Time (months)	CM	ST	Intergroup differences	
		Mean (SD)	Mean (SD)	t	p
CAN patients' needs	0	9.14 (7.43)	7.43 (3.32)	2.784	0.006
	12	7.89 (3.56)	7.01 (2.80)	1.527	0.129
GAF clinical	0	42.03 (7.15)	47.01 (8.71)	−3.834	< 0.001
	12	46.65 (11.20)	49.14 (10.46)	−1.351	0.179
GAF social	0	40.44 (8.63)	45.27 (9.10)	−3.335	0.001
	12	42.35 (9.43)	47.04 (10.77)	−2.725	0.007
DAS-s	0	10.20 (4.51)	9.03 (3.86)	1.712	0.089
	12	9.03 (4.46)	8.93 (4.36)	0.135	0.893
WHOQOL-BREF physical health	0	12.64 (2.25)	13.61 (2.29)	−2.614	0.010
	12	13.00 (2.64)	13.62 (2.20)	−1.499	0.136
WHOQOL-BREF psychological health	0	11.64 (2.80)	12.36 (2.57)	−1.621	0.107
	12	12.02 (2.82)	12.46 (2.56)	−0.969	0.334
WHOQOL-BREF social relationships	0	10.17 (3.20)	10.52 (2.90)	−0.713	0.477
	12	12.30 (3.18)	10.43 (2.95)	−0.259	0.796
WHOQOL-BREF environment	0	12.75 (2.28)	13.16 (2.04)	−1.156	0.250
	12	13.07 (2.27)	13.63 (2.43)	−1.412	0.160
WHOQOL-BREF general	0	78.12 (13.14)	82.72 (11.82)	−2.254	0.026
	12	80.51 (14.46)	83.72 (12.23)	−1.411	0.161
FSSQ total social support	0	36.23 (9.94)	37.31 (8.54)	−0.713	0.477

	12	37.22 (10.02)	36.64 (8.71)	0.363	0.717
FSSQ confidant support	0	16.40 (5.20)	16.97 (4.80)	−0.699	0.486
	12	16.72 (4.96)	16.51 (5.19)	0.252	0.802
FSSQ affective support	0	10.82 (3.20)	11.16 (3.08)	−0.652	0.516
	12	11.16 (3.18)	10.75 (3.11)	0.757	0.450

Note. n=75 at baseline and n=69 at one year follow-up for the case management and standard treatment programmes

CM: Case Management; ST: Standard Treatment; SD: Standard Deviation; CAN: Camberwell Assessment of Needs Questionnaire; PANSS: Positive and Negative Syndrome Scale; GAF: Global Assessment of Functioning; DAS-s: Disability Assessment Schedule Short Form; WHOQOL-BREF: World Health Organization Quality of Life Scale Brief Version; FSSQ: Modified DUKE-UNC Functional Social Support Questionnaire

Table 4. Use of services (categorical variables) according to treatment programme

		CM		ST				
	Time (months)	f	%	f	%	χ^2	df	p
Inpatient hospital services								
Acute unit	0	20	26.7	10	13.3	4.167	1	0.041
	12	10	14.5	4	5.8	2.862	1	0.091
Sub-acute unit	0	5	6.7	3	4.0	0.528	1	0.467
	12	4	5.8	1	1.4	1.868	1	0.172
General hospital unit	0	2	2.7	0	0	2.027	1	0.155
	12	0	0	0	0	-	-	-
Overall use of inpatient hospital services	0	24	32.0	12	16.0	5.263	1	0.022
	12	11	15.9	6	8.7	1.677	1	0.195
Outpatient hospital services								
Day hospital	0	4	5.3	2	2.7	0.174*	1	0.677
	12	0	0	1	1.4	1.007*	1	1.000
Outpatient hospital services	0	5	6.7	5	6.7	0.000	1	1.000
	12	2	2.9	0	0	0.507**	1	0.154
Emergency services	0	17	22.7	8	10.7	3.888	1	0.049
	12	9	13.0	3	4.3	3.286	1	0.070
Crisis services	0	3	4.0	1	1.3	1.027**	1	0.620
	12	1	1.4	0	0	1.007	1	1.000
Overall use of outpatient hospital services	0	22	29.3	15	20.0	1.758	1	0.185
	12	12	17.4	3	4.3	6.059	1	0.014
Community services								

		CM f	CM %	ST f	ST %	χ²	df	p
Community psychological services	0	10	13.3	10	13.3	0.000	1	1.000
	12	6	8.7	6	8.7	0.000	1	1.000
Community social work services	0	42	56	33	44.0	2.160	1	0.142
	12	52	69.3	38	50.7	5.444	1	0.020
Community rehabilitation services	0	16	21.3	13	17.3	0.385	1	0.535
	12	19	27.5	12	17.4	2.039	1	0.153
Specialised rehabilitation services	0	14	18.7	8	10.7	1.918	1	0.166
	12	16	23.2	9	13.0	2.394	1	0.122
Protected vocational workshops	0	6	8.0	6	8.0	0.000	1	1.000
	12	3	4.3	6	8.7	1.070	1	0.301
Educational, vocational or leisure services	0	11	14.7	18	24.0	2.095	1	0.148
	12	10	14.5	15	21.7	1.221	1	0.269
Social services	0	16	21.3	1	1.3	14.927	1	0.000
	12	9	13.0	2	2.9	4.840	1	0.028
Emergency phone calls	0	9	12.0	6	8.0	0.667	1	0.414
	12	4	5.8	5	7.2	0.119	1	0.730
Primary care services								
General practitioner	0	47	62.7	47	62.7	0.000	1	1.000
	12	49	71.0	52	75.4	0.332	1	0.564
Primary care nursing	0	19	25.3	25	33.3	1.158	1	0.282
	12	17	24.6	28	40.60	3.990	1	0.046
Home, family and social work	0	9	12.0	3	4.0	3.261	1	0.071
	12	7	10.1	5	7.2	0.356	1	0.546

Note. *Yate's test continuity correction; **Excat Fisher Test

CM: Case Management; ST: Standard Treatment; f: frequency; %: percentage; df: degrees of freedom

Table 5. Service use variables in the case management programme group and the standard treatment programme group at baseline and at one year follow-up

Service	Time (months)	CM		ST		Intergroup differences	
		n	Mean (SD)	n	Mean (SD)	T/Z	p
Inpatient hospital services							
Acute psychiatric unit (days)	0	20	17.84 (11.41)	10	22.56 (9.28)	−1.480	0.139
	12	10	18.13 (8.54)	4	15.75 (10.81)	−0.681	0.496
Acute psychiatric unit (admissions)	0	20	1.00 (0.00)	10	1.00 (0.00)	-	-
	12	10	1.00 (0.00)	4	1.25 (0.50)	−1.414	0.157
Crisis unit (days)	0	0	0.00 (0.00)	0	0.00 (0.00)	-	-
	12	1	18.00 (0.00)	0	0.00 (0.00)	-	-
Crisis unit (admissions)	0	0	0.00 (0.00)	0	0.00 (0.00)	-	-
	12	1	1.00 (0.00)	0	0.00 (0.00)	-	-
Sub-acute unit (days)	0	5	62.40 (38.19)	3	88.00 (67.62)	−1.050	0.294
	12	4	67 (27.40)	1	29.50 (9.19)	−1.732	0.083
Sub-acute unit (admissions)	0	5	1.00 (0.00)	3	1.00 (0.00)	-	-
	12	3	1.00 (0.00)	2	1.00 (0.00)	-	-
Medium/long stay unit (days)	0	0	0.00 (0.00)	0	0.00 (0.00)	-	-
	12	0	0.00 (0.00)	1	6.00 (0.00)	-	-
Medium/long stay unit (admissions)	0	0	0.00 (0.00)	0	0.00 (0.00)	-	-
	12	0	0.00 (0.00)	0	0.00 (0.00)	-	-
General hospitalisation unit (days)	0	2	2.00 (1.41)	0	0	-	-
	12	0	0.00 (0.00)	0	0.00 (0.00)	-	-

General hospitalisation unit (admissions)	0	2	1.00 (0.00)	0	0	-	-
	12	0	0.00 (0.00)	0	0.00 (0.00)	-	-
Overall inpatient hospital (days)	0	24	29.68 (29.86)	12	21.30 (9.60)	−0.293	0.770
	12	11	46.18 (51.20)	6	21.33 (19.49)	−1.409	0.159
Overall inpatient hospital (admissions)	0	24	1.00 (0.00)	12	1.00 (0.00)	-	-
	12	11	1.45 (0.69)	6	1.00 (0.00)	−1.348	0.178
Outpatient psychiatric hospital services							
Outpatient hospital visits	0	5	17.80 (13.18)	5	1.25 (0.50)	−2.491	0.013
	12	2	3.00 (2.83)	0	0	-	-
Crisis unit visits	0	3	1.00 (0.00)	1	4.00 (0)	−1.732	0.083
	12	1	1.00 (0.00)	0	0	-	-
Emergency service visits	0	17	1.53 (0.74)	8	1.38 (0.74)	−0.612	0.540
	12	9	2.11 (1.69)	3	16.67 (24.58)	−1.025	0.413
Day hospital	0	4	55.00 (54.08)	2	160.00 (224.86)	−0.651	0.628
	12	0	0.00 (0.00)	1	9.00 (0.00)	-	-
Outpatient psychiatric hospital visits	0	20	8.40 (11.24)	13	1.62 (0.96)	2.684	0.039
	12	12	2.17 (1.75)	3	19.67 (29.77)	−1.023	0.306
Community services							
Community psychiatric visits	0	73	5.85 (2.94)	73	4.70 (2.54)	2.528	0.013
	12	68	6.18 (3.50)	69	5.22 (2.57)	1.830	0.069
Community psychology visits	0	10	4.22 (2.86)	10	5.90 (4.41)	−0.495	0.621
	12	6	6.50 (4.51)	6	4.67 (2.94)	−1.158	0.247
Community psychiatric nursing visits	0	75	7.81 (7.48)	74	4.42 (5.38)	3.183	0.002
	12	69	11.64 (8.35)	68	4.94 (5.97)	5.409	0.000
Community social work visits	0	42	4.55 (3.59)	33	4.79 (3.57)	−0.288	0.774
	12	52	3.82 (3.21)	38	4.09 (2.61)	−0.394	0.695

| Community rehabilitation centre | 0 | 16 | 183.63 (168.19) | 13 | 252.62 (138.13) | –0.774 | 0.439 |
| | 12 | 19 | 132.32 (168.99) | 12 | 242.92 (140.52) | –1.453 | 0.146 |

CM: Case Management; ST: Standard Treatment; SD: Standard Deviation