Considering variables for the assignment of patients with schizophrenia to a case management programme

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Abstract:

The elements and intensity of Case Management (CM) practices should be established according to patients' needs. Therefore, it is important to improve the knowledge of the needs of patients in such a community-based intervention. This paper deals with this issue by characterizing two groups of patients receiving CM or a Standard Treatment Programme (STP) and identifying the patients' characteristics associated with the provision of CM services.

We recruited 241 patients with schizophrenia from 10 Adult Mental Health Centers from Barcelona (Catalonia, Spain). We analyzed the profile of new patients included in a clinical and non-intensive CM program with that of patients in a STP.

CM patients showed a poorer profile. Community psychiatric visits, social services, education, physical health, needs and positive symptoms were significantly associated with the provision of CM services.

This study may help in identifying patients' necessities and strengthen the CM programme.

Introduction

Case Management (CM) has been described as the coordination, integration and allocation of individualised care within limited resources through the assignment of a key worker from a community mental health team (Thornicroft, 1991). It is widely considered to be a major component of the services provided to patients with severe mental illness (SMI) (Rubin, 1992).

Nowadays, it has been highlighted the importance of establishing the elements and the intensity of CM on the basis of patients' needs (Working Group of the Clinical Practice Guideline for Schizophrenia and Incipient Psychotic Disorder, 2011). For instance, the Flexible Assertive Community Treatment model (van Veldhuizen, 2007) has been developed in the Netherlands as an adaptation of CM. It is a rehabilitation-oriented clinical CM model that can operate individually or by means of a team approach depending on patient's needs.

Patients with schizophrenia differ in their level of needs as suggested by the existence of different profiles of those patients (Lora, Consentino, Rossini, & Lanzara, 2001; Lykouras, Oulis, Daskalopoulou, Psarros, & Christodoulou, 2001). Lykouras et al. (2001) found five profiles of patients with schizophrenia with regard to psychiatric symptoms, while Lora et al. (2001) found four profiles of patients with schizophrenia, considering disability, psychiatric symptoms, psychosocial measures and use of mental health services. The existence of different profiles of patients with schizophrenia show the need to tailor interventions according to those profiles especially for those persons with greater care needs (Lora et al., 2001), which is associated with the previous idea of considering CM practices according to patients' needs (Working Group of the Clinical Practice Guideline for Schizophrenia and Incipient Psychotic Disorder, 2011).

Taking into account all the above mentioned, it is important to improve the knowledge of the characteristics/needs of persons with schizophrenia receiving community-based interventions such as CM. This study deals with this issue by: 1) characterizing two groups of patients with schizophrenia receiving either CM or a standard treatment programme (STP) in Catalonia (Spain); and 2) identifying the socio-demographic, use of services, clinical and psychosocial characteristics of patients with schizophrenia associated with the provision of CM in the aforementioned setting. Our final aim is to help improve the knowledge of the needs of patients receiving CM in Catalonia, which might help to tailor services to those needs and, consequently, design and adapt CM services in such a setting. This is of relevance because there is country culture influence on CM practices (Burns, Fioritti, Holloway, Malm, & Rössler, 2001).

A CM programme model

During the Spanish political transition to democracy which began in 1975, a new model of mental health care was developed in Catalonia, one of Spain's autonomous regions. This new model involved a state mental health network within the national health system and structured into health-care sectors of approximately 100,000 inhabitants. This network is community-based and relies on community resources such as Adult Mental Health Centres (AMHCs), community rehabilitation centres and hospitals.

AMHCs offer specialised care for people suffering from mental health problems and are staffed by multidisciplinary teams that include psychiatrists, psychologists, nurses and social workers. AMHCs care for patients with SMIs through a STP, the key components of which are a general clinical and psychosocial assessment and medical interventions and follow-ups.

In 1997, the Catalan Health Department set up a new programme for the care of patients with SMI at risk of dropping out, clinical relapse and recurrent hospitalisation. This new

programme is based on the principles of clinical CM (Kanter, 1989), is non-intensive (Dieterich, Irving, Park, & Marshall, 2010) and includes as main elements (Ruggeri & Tansella, 2008): 1) assignment of a case manager (i.e. a community mental health nurse) to look at and organise the care of patient; 2) thorough assessment of needs at a medical and psychosocial level; 3) individualised therapy plans based on the patient's needs; and 4) regular checks and updating of therapy plans. The STP and the CM programme are alike in that they both include a psychiatrist as clinician in charge, and medical interventions and follow-ups (4-6 visits per year). However, the CM programme not only contains the elements described above, but also includes specific psychosocial interventions (i.e. psychoeducation, family therapy, assistance in daily living and crisis intervention) and nursing follow-ups (12 visits per year). All interventions provided by the STP or the CM programme adhere to the Clinical Practice Guidelines for Schizophrenia issued by the Spanish Ministry of Health and Consumer Affairs (Working Group for the Clinical Practice Guidelines for Schizophrenia and Incipient Psychotic Disorder, 2009).

Improving knowledge about both community treatment programmes is particularly important since this concerns the treatment of most long-term patients with schizophrenia in the Catalan Health System. Our study addresses this issue by characterizing the profiles of patients with schizophrenia according to treatment programme. Our aim is to test the working hypothesis that CM patients exhibit greater social and care needs and clinical and psychosocial disadvantages than STP patients. The issue is also addressed through more in-depth analysis of the socio-demographic, use of services, clinical and psychosocial characteristics of patients with schizophrenia associated with the provision of CM services in Catalonia (Spain). To our knowledge, no such studies have been conducted to date and, moreover, studies on CM in Spain

with large sample sizes have been few and far between and restricted to cost-effectiveness (Gutiérrez-Recacha, Chisholm, Haro Abad, Salvador-Carulla, & Ayuso-Mateos, 2006) and hospitalisation variables (Alonso Suárez, Bravo-Ortiz, Fernández-Liria, & González-Juárez, 2011). This study may help to enhance understanding of patient needs, tailor interventions to those needs and, consequently, design and adapt the CM programme.

Methods

This study has been conducted as part of a one-year, longitudinal, quasi-experimental study that aims to compare the effectiveness of the CM programme and the STP. The patients, instruments, procedures and data analysis are described below.

Patients

The sample was a group of 241 patients with schizophrenia from 10 AMHC in Barcelona (Catalonia, Spain) recruited between December 2006 and January 2008. Patients for the CM programme were consecutively selected among those in the STP who met the following inclusion criteria: 1) diagnosis of schizophrenia according to the International Classification of Diseases-10 or ICD-10 (World Health Organisation, 1995); 2) Global Assessment of Functioning or GAF $\leq$ 50 (Endincott, 1976); 3) duration of illness greater than 2 years; and 4) clinical stability at time of assessment. It is worth highlighting that the three first inclusion criteria are based on the National Institute of Mental Health (NIMH, 1978) criteria for SMI operationalized by Ruggeri, Leese, Thornicroft, Bisoffi, and Tansella (2000). Clinical stability was defined as the patient condition that allows to treat her or him in an outpatient setting as that in our study. Patients were excluded if they had dementia, organic brain injury or mental retardation. Patients in the STP were selected from the AMHC databases by intentional non-probabilistic sampling among all patients in the STP who could be matched with

patients in the CM programme according to the following criteria: gender; diagnosis; age (+/- 5 years); dysfunction (GAF score, +/- 10 points); and duration of illness (+/- 5 years). Socio-demographic characteristics of patients according to each treatment programme are described in Table 1.

INSERT TABLE 1 ABOUT HERE

Instruments

The following instruments were used in the study for the assessment of patients:

The Schizophrenia Cost Evaluation Questionnaire (Haro, Salvador-Carulla, Cabases, Madoz, & Vázquez-Barquero, 1998) based on the Client Socio-Demographic and Services Receipt Inventory (Beecham, 1994). This instrument assesses use of healthcare and social services and its indirect costs.

The GAF (Endincot, 1976). This is a reliable and valid measure of global psychological functioning in patients with SMI that was included in the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (American Psychiatric Association, 1994).

The Positive and Negative Syndrome Scale or PANSS (Kay, Fiszbein, & Opler, 1987). This instrument is used for assessing symptom severity in patients with schizophrenia and it has been translated into and validated in Spanish (Peralta & Cuesta, 1994). Internal consistency values of its subscales range between medium and high and its convergent validity with other measures of psychiatric symptoms were high and range from 0.70 to 0.81 (Peralta & Cuesta, 1994).

The Disability Assessment Schedule, short form or DAS-s (Janca et al., 1996). This is a seven-item scale developed by the World Health Organisation and is a valid and reliable measure of global functioning in patients with mental disorders included in the ICD-10 (World Health Organisation, 1995). It has been validated in patients with schizophrenia (Mas-Expósito, Amador-Campos, Gómez-Benito, & Lalucat-Jo, 2011a).

The World Health Organisation Quality of Life Scale Brief Version or WHOQOL-BREF (World Health Organisation, 1993). This is a short version of the World Health Organisation Quality of Life Scale or WHOQOL-100, which is considered an international cross-culturally analogous quality of life evaluation tool (World Health Organisation, 1998). Internal consistency values ranged from 0.66 to 0.84; and correlations with the WHOQOL-100 subscales ranged from 0.89 to 0.95 (World Health Organisation, 1998). Skevington, Lotfy, and O'Connell (2004) confirmed and extended information about its properties and showed good-to-excellent psychometric properties. There is a Spanish version (Lucas, 1998) that shows good psychometric properties in patients with schizophrenia (Mas-Expósito, Amador-Campos, Gómez-Benito, & Lalucat-Jo, 2011b).

The Functional Social Support Questionnaire or FSSQ (Broadhead, Gelbach, Degruy, & Kaplan, 1988). This is an eight-item questionnaire that measures the strength of the patients' social network. It has also been translated into and validated in Spanish (Bellón Saameño, Delgado Sánchez, de Dios Luna del Castillo, & Lardelli Claret, 1996) and the reliability indexes are of 0.80 and of 0.92 for hetero-report and self-report, respectively. Concurrent validity with other health measures ranged in absolute values from 0.13 to 0.81 (Bellón Saameño et al., 1996).

Camberwell Assessment of Needs or CAN (Phelan, Slade, & Thornicroft, 1999). It is an assessment tool to measure the psychosocial needs of people suffering from mental illness. Inter-rater and test-retest correlations of the total number of needs recognised by staff were 0.99 and 0.78, respectively. The percentage of agreement on individual items ranged from 81.6-100% (inter-rater) and 58.1-100% (test-retest) (Phelan et al., 1999). It is translated into and validated in Spanish (Jiménez-Estévez, Moreno-Kustner, & Torres-González, 1997). In a Spanish sample of patients with schizophrenia, the inter-

rater correlations were high for either clinicians (0.99) or patients (0.98); test-retest correlations were high for clinicians (0.79) and patients (0.77) (Rosales, Torres, Del Castillo, Jímenez, & Martínez, 2002).

Procedures

The procedures and assessments were described to each patient and informed consent was obtained. The AMHC multidisciplinary teams performed the patient assessments. For both the CM group and the STP group, the diagnosis was established by the psychiatrists by means of a non-structured interview following the ICD-10 (World Health Organisation, 1995) research diagnosis criteria and considered self-reports and caregiver reports. The psychiatrist also carried out the assessment of psychiatric symptoms, while the remaining assessments were performed by the other members of the AMHC multidisciplinary team under the psychiatrist's supervision or by an assigned community psychiatric nurse from the AMHC multidisciplinary team in the STP. The psychiatrist was responsible for setting up the assessment agenda, supervising its development and sending the score sheets to the psychologist in charge of the design and analysis of the study database.

To ensure the quality of assessment data, all psychiatrists participated in a schizophrenia diagnostic agreement workshop comprising two case vignettes. All researchers were trained in the administration of the instruments in a 4-hour session run by a psychologist with experience in psychological assessment of psychiatric patients. Systematic reviews of data coding and registration were taken and patient information was contrasted with data from the AMHC responsible for each patient.

Data analysis

To test differences between groups, Chi-square analysis for categorical variables and independent samples Student's *t* test for continuous variables were used and the effect

size was calculated (Field, 2005). Block-entry logistic regression was used to determine the patients' characteristics associated with the provision of CM services. Programme allocation (i.e. CM or STP) was introduced as the dependent variable. Variables with significant between-group differences, except for program inclusion criteria, were included in the logistic regression model and their contribution to the model was assessed. The variables introduced were: educational level, social services visits, community psychiatric nursing visits, positive psychiatric symptoms (PANSS positive), total psychiatric symptoms (PANSS total), disability (DAS-s), physical health (WHOQOL-BREF physical health) and psychosocial needs from the clinicians' point of view (CAN total needs). Since educational level was a categorical variable with more than two categories, it was necessary to recode it into the following dummy variables: no education, primary education, secondary education and higher education. P values < 0.05 were considered significant. Data was analysed using the Statistical Package for the Social Sciences (SPSS) v.18.

Ethic Aspects

The study was approved by the Ethics Committee of the Fundació Unió Catalana d'Hospitals and was conducted in accordance with the ethical standards of the 1964 Declaration of Helsinki. The authors declare that they have no conflict of interest and they certify their responsibility for the manuscript.

Results

Table 1 shows the results for socio-demographic variables. There were statistically significant between-group differences, with small effect sizes, in educational level. Patients in the CM program had lower educational level than patients in the STP. No other statistically significant differences were found in socio-demographic variables.

Table 2 shows the results for variables regarding health-service use during the previous year. There were statistically significant between-group differences in the use of emergency services, community psychiatric nursing services and social services with medium effect sizes. Patients in the CM program made higher use of the above-mentioned services than patients in the STP. No other statistically significant differences were observed.

INSERT TABLE 2 ABOUT HERE

Table 3 shows the results for clinical and psychosocial variables. There were statistically significant between-group differences in positive (PANSS positive) and total psychiatric symptoms (PANSS total), disability (DAS-s), quality of life related to physical health (WHOQOL-BREF physical health), overall quality of life (WHOQOL-BREF general) and psychosocial needs from the clinicians' point of view (CAN total needs). The effect size was small for all variables. CM patients had higher levels of positive and total psychiatric symptoms, disability and needs; whilst they showed lower quality of life related to physical health and overall quality of life than patients in the STP. There were no other statistically significant differences between groups. However, there was a tendency to significance in negative psychiatric symptoms (PANSS negative) and general psychiatric symptoms (PANSS general).

There were statistically significant between-group differences in clinical functioning (GAF clinical) and social functioning (GAF social). CM patients showed lower clinical (M=43.82, SD=8.73) and social functioning (M=40.95, SD=8.57) than patients in the STP (clinical functioning: M=50.02, SD=10.06; social functioning: M=47.62, SD=10.27). The effect size was medium (GAF clinical: r=0.31; GAF social: r=0.34). Those differences may be related to the assignment of patients to the intervention

programmes. The STP group patients were matched to CM patients considering a range of GAF scores of +/- 10 points.

INSERT TABLE 3 ABOUT HERE

Table 4 shows the patients' variables significantly associated with the provision of CM services. Community psychiatric nursing visits, social services visits, educational level (i.e. higher vs. secondary), quality of life related to physical health (WHOQOL-BREF physical health), psychosocial needs from the clinicians' point of view (CAN total needs) and positive psychiatric symptoms (PANSS positive) were significantly associated with the provision of CM services The following variables were not significantly associated with the provision of CM services: emergency visits (B=0.222, B.SE=0.192, Wald statistic=1.347, d.f.=1, p=0.246); total psychiatric symptoms (PANSS total; B=-0.003, B.SE=0.013, Wald statistic=0.059, d.f.=1, p=0.808); disability (DAS-s; B=-0.031, B.SE=0.047, Wald statistic=0.451, d.f.=1, p=0.502); and overall quality of life (WHOQOL-BREF general; B=0.020, B.SE=0.021, Wald statistic=0.913, d.f.=1, p=0.339).

INSERT TABLE 4 ABOUT HERE

Discussion

The aim of this work was two-fold: 1) characterize the two group of patients with schizophrenia according to treatment programme (i.e. CM programme and STP); and 2) identify the patients' characteristics associated with the provision of CM practices in Catalonia (Spain). This may help have further knowledge of patients' needs and thus design and adapt the CM programme for patients with long-term schizophrenia running in the aforementioned setting.

Patients included in the CM programme and the STP showed distinctive profiles as shown by differences between both groups. Patients in the CM programme had lower

educational level and used emergency services, community psychiatric nursing services and social services more frequently. Also, these patients had higher levels of positive psychiatric symptoms, total psychiatric symptoms, psychosocial needs and disability, while they had poorer levels of quality of life related to physical health and overall quality of life. As expected, patients in CM services were found to have greater social and care needs, and higher clinical and psychosocial disadvantages than patients in the STP. With regard to our second objective, the patients' characteristics significantly associated with the provision of CM practices in Catalonia were use of community psychiatric nursing services, use of social services, educational level, quality of life related to physical health, psychosocial needs and positive psychiatric symptoms.

Our results are consistent with the available literature about the existence of different profiles of patients with schizophrenia (Lykouras et al.,2001; Lora et al., 2001) and the need to tailor interventions according to those profiles especially for those persons with greater needs (Lora et al., 2001). Patients receiving more intensive and comprehensive services (i.e. CM services) appear to have higher social, care, clinical and psychosocial needs. Also, our results provide a better understanding of the needs of patients with schizophrenia receiving CM services in that setting, which may help to tailor CM practices into patients' needs. Taking into account patients' needs, the CM programme may consider other interventions besides those described in the introduction. Cognitive behaviour therapy may be considered to decrease positive psychiatric symptoms (Wykes, Steel, Everitt, & Tarrier, 2008); while strategies that target patients' social cognition may help to promote community functioning (Harvey & Penn, 2010) and strategies aimed at improving patients' physical health (Acil, Dogan, & Dogan, 2008; Sáiz Ruiz, Bobes García, Vallejo Ruiloba, Giner Ubago, & García-Portilla González, 2008; Saravane et al., 2009) may decrease physical morbidity and mortality (Sáiz Ruiz

et al., 2008). Physical activities to cope with cardio-metabolic risk factors (Vancampfort, Sweers, Probst, Mitchell, Knapen, & De Hert, 2011) or physical health in general terms (Van Citters et al., 2010) may be introduced into the CM programme by mental health nurses, who have the knowledge and expertise in this type of intervention and are the patients' key workers. We suggest a reconfiguration of the CM programme taking into account patients' needs. If so, a study about its efficacy/effectiveness should be conducted by comparing outcomes in a group of patients with schizophrenia receiving the reconfigurated CM programme with outcomes in a group of patients with schizophrenia receiving the original CM programme.

In addition, our findings highlight other variables, besides those stated by NIMH (1987), which may be considered in the definition of SMI in the Catalan Health Service. It is worth noting that there is no consensus on the definition of SMI (Parabiaghi, Bonetto, Ruggeri, Lasalvia, & Leese, 2006; Slade, Powell, & Strathdee, 1997) as seen in the inclusion criteria program of studies on the efficacy of CM for persons with SMI (Bond, McGrew, & Fekete, 1995; Burns, Catty, Dash, Roberts, Lockwood, & Marshall, 2007; Dieterich et al., 2010; Gorey, Leslie, Morris, Carruthers, John, & Chacko, 1998; Herdelin & Scott; 1999; Marshall, Gray, Lockwood, & Green, 2000; Marshall & Lockwood, 2000; Ziguras & Stuart, 2000). Therefore, some authors (Ruggeri et al., 2000; Parabiaghi et al., 2006) have operationalized it considering the NIMH definition (1987) and mental disorders and psychotic disorders in general terms. Our study goes beyond the NIMH (1987) definition and is exclusively based on patients with schizophrenia. This study may help to provide a context for improving the definition of SMI at a regional level but, in view of the fact that the outcomes used are common to clinical practice and research, our results may also be easily replicated at other levels.

One of the limitations of our study is that we did not use a structured interview to establish patient psychiatric diagnosis. Although this might affect the reliability of diagnoses, they were conducted by experienced research psychiatrists and following the research criteria diagnosis established by the ICD-10 (World Health Organisation, 1995) as well as considered self-reports and caregiver reports. Another limitation is the fact that patients' assessments were not conducted by independent assessors, which might have biased the results. Even so, the consistency of our results with the literature gives some confidence that assessor bias did not affect outcomes. In addition, it is worth noting that patients in the STP were matched to patients in the CM group considering a range of GAF scores of +/- 10 points. The results show lower GAF scores in the CM group than in the STP group, which may be related to the aforementioned matching process. Since GAF scores are determined by social functioning but also psychiatric symptoms it was not unexpected that PANSS positive and total scores were higher in the CM group than in the STP group. Even so, only PANSS positive scores were significantly associated with the provision of CM services. The PANSS may be more specific than the GAF when assessing psychiatric symptoms since it takes into account the type of symptoms as well as its severity.

Further research may consider a shorter GAF range when matching programmes groups and include more specific and objective measures regarding physical health. Physical health was measured indirectly through an instrument that measures health-related quality of life and is rated by patients. Case managers in the study were community psychiatric nurses with high knowledge and high expertise on the field. Even so, the nature and level of expertise of case managers varies widely between settings. Additional studies may take into account case managers' variables and see how they may affect outcomes. It has been shown that there is a relationship between case

managers' expectations and employment in patients with schizophrenia (O'Connell & Stein, 2011).

In sum, the characterization of patients with schizophrenia according to treatment programme and the knowledge of patients' characteristics associated with the provision CM practices in the Catalan Health Service (Spain) may be important in identifying patients' needs and, consequently, designing and adapting the CM programme.

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Table 1. Socio-demographic variables according to treatment programme

	CM (n=119)	STP (n=122)	Intergroup differences			
Socio-demographic variables	**f (%)**	**f (%)**	**χ2**	**df**	**p**	**r**
Male	80 (67.2)	83 (68.0)	.018	1	.894	
Marital status			3.254	2	.196	
Single	90 (75.6)	91 (74.6)				
Married or long-term partner	12 (10.1)	20 (16.4)				
Separated, divorced or widowed	17 (14.3)	11 (9.0)				
Educational level			9.890	3	.020	.203 CM ↓
No education	14 (11.8)	11 (9.0)				
Primary education	37 (31.1)	51 (41.8)				
Secondary education	56 (47.1)	37 (30.3)				
Higher education	12 (10.1)	23 (18.9)				
ICD-10 code schizophrenia diagnosis			2.983	3	.394	
F20.0	81 (68.1)	89 (73)				
F20.3	11 (9.2)	15 (12.3)				
F20.5	14 (11.8)	8 (6.6)				
Other codes	13 (10.8)	10 (8.2)				
Living arrangement			3.566	5	.613	
Alone	24 (20.2)	18 (14.8)				
With son/daughter or son/daughter and partner	8 (6.7)	10 (8.2)				
With partner	9 (7.6)	14 (11.5)				
With parents	59 (49.6)	65 (50.8)				
With other relatives	8 (6.7)	11 (9.0)				
With other persons or in an institution	11 (9.2)	7 (5.7)				
Accommodation type			5.637	2	.060	
Family property	74 (62.2)	92 (75.4)				
Rented	32 (26.9)	24 (19.7)				
Hostel, supported sheltered accommodation, therapeutic community, homeless or other	13 (10.9)	6 (4.9)				

Employment status			8.086	6	.232
Employed or self-employed	5 (4.2)	16 (13.1)			
Student, volunteer or supported employment	7 (5.9)	10 (8.2)			
Unemployed or on sick leave	7 (5.9)	9 (7.4)			
House work	8 (6.7)	7 (5.7)			
Retired	12 (10.1)	8 (6.6)			
Never worked	10 (8.4)	7 (5.7)			
Incapacitated	70 (58.8)	65 (53.3)			
Employment attitude			8.439	5	.134
Patient feels cannot work	58 (48.7)	51 (41.8)			
Patient feels cannot do his/her usual work	8 (6.7)	6 (4.9)			
Patient does not want to work	8 (6.7)	6 (4.9)			
Patient wants to work but cannot find a job	18 (15.1)	12 (9.8)			
Patients works	9 (7.6)	9 (7.6)			
Other	18 (15.1)	21 (17.2)			

	Mean (SD)	**Mean (SD)**	**t**	**p**
Age	41.66 (11.67)	41.77 (11.58)	- .077	.939
Illness duration	2.65 (.65)	2.61 (.68)	.489	.635

CM: Case Management; STP: Standard Treatment Programme

f: frequency; %: percentage; df: degrees of freedom; r: effect size; SD: standard deviation; ↑: higher frequencies in the CM programme group; ↓: lower frequencies in the CM programme group

Table 2. Service-use variables during the previous year according to treatment programme

	CM (n=119)	STP(n=122)	Intergroup differences				
Service type	**Mean (SD)**	**Mean (SD)**	**t**		**p**	**r**	
General hospital services							
Acute psychiatric unit (days)	5.67 (13.14)	4.18 (13.76)	.860		.390		
Acute psychiatric unit (admissions)	.50 (1.94)	.18 (.45)	1.727		.087		
Crisis unit (days)	.17 (1.83)	.01 (.09)	.962		.337		
Crisis unit (admissions)	.01 (.09)	.01 (.09)	.018		.986		
Sub-acute unit (days)	3.65 (17.98)	4.36 (29.02)	–.229		.819		
Sub-acute unit (admissions)	.05 (.22)	2.25 (24.44)	–.980		.328		
Psychiatric high-dependency/medium-long stay unit (days)	0	0	-		-		
Psychiatric high-dependency/medium-long stay units (admissions)	0	0	-		-		
General hospital unit (days)	.07 (0.47)	0	1.579		.117		
General hospital unit (admissions)	.03 (0.22)	0	1.645		.103		
Outpatient psychiatric hospital services							
External hospital visits	.82 (4.35)	.11 (.76)	1.731		.086		
Crisis unit visits	.07 (.48)	.03 (.36)	.628		.531		
Emergency service visits	.66 (1.98)	.16 (.57)	2.656		.009	.228	CM ↑
Day Hospital visits	3.48 (19.55)	3.32 (29.83)	.044		.965		
Community services							
Community psychiatry visits	6.18 (3.67)	5.47 (4.88)	1.273		.204		
Community psychology visits	.98 (3.19)	1.08 (4.64)	–.192		.848		
Community psychiatric nursing visits	7.58 (7.62)	3.96 (5.87)	4.127		<.001	.221	CM ↑
Community social work visits	2.43 (3.39)	1.74 (3.05)	1.666		.097		
Community day centre services visits	44.61 (112.92)	29.98 (94.57)	1.092		.276		
	f (%)	**f (%)**	**χ2**	**df**	**p**	**r**	
Community services							
Specialised rehabilitation services	21 (17.6)	12 (9.8)	3.110	1	.093		
Protected vocational workshops	8 (6.7)	8 (6.6)	.003	1	.959		
Educational or vocational or leisure services	20 (16.8)	23 (18.9)	.172	1	.678		
Social services	19 (16.0)	3 (2.5)	13.249	1	<.001	.234	CM ↑
Primary care centre	46 (38.7)	52 (42.6)	.393	1	.531		

Emergency phone calls	14 (11.8)	8 (6.6)	1.969	1	.161
Primary care services					
General practitioner	78 (65.5)	78 (63.9)	.069	1	.973
Primary care nursing	30 (25.2)	38 (31.1)	1.049	1	.306

CM: Case Management; STP: Standard Treatment Programme
SD: standard deviation; r: effect size; f: frequency; %: percentage; df: degrees of freedom; ↑: higher scores or frequencies in the CM programme group

Table 3. Clinical and psychosocial variables according to treatment programme

	CM (n=119)	STP (n=122)	Intergroup differences			
Assessment Scales	**Mean (SD)**	**Mean (SD)**	**t**	**p**	**r**	
PANSS[1] positive	17.90 (6.65)	15.80 (6.10)	2.561	.011	.163	CM ↑
PANSS negative	25.01 (6.87)	23.34 (7.16)	1.840	.067		
PANSS general	44.04 (12.66)	40.89 (12.62)	1.934	.054		
PANSS total	86.95 (22.47)	80.03 (22.43)	2.391	.018	.152	CM ↑
DAS-s[2]	9.93 (4.42)	8.37 (4.40)	2.752	.006	.175	CM ↑
WHOQOL-BREF[3] physical health	12.84 (2.41)	13.61 (2.36)	–2.522	.012	.161	CM ↓
WHOQOL-BREF psychological health	11.86 (2.97)	12.47 (2.59)	–1.695	.091		
WHOQOL-BREF social relationships	10.24 (3.44)	10.93 (2.99)	–1.658	.099		
WHOQOL-BREF environment	13.06 (2.36)	13.37 (2.05)	–1.065	.288		
WHOQOL-BREF general	79.73 (14.39)	83.66 (12.53)	–2.260	.025	.145	CM ↓
FSSQ[4] social support	36.17 (9.86)	37.47 (8.64)	–1.089	.277		
FSSQ confidant support	16.42 (5.14)	16.99 (4.67)	–.902	.368		
FSSQ affective support	10.72 (3.12)	11.12 (3.14)	–.972	.332		
CAN[5] total needs	8.80 (4.01)	7.08 (3.44)	3.446	.001	.225	CM ↑

CM: Case Management; STP: Standard Treatment Programme

1. PANSS: Positive and Negative Syndrome Scale; 2. DAS-s: Disability Assessment Schedule Short Form; 3. WHOQOL-BREF: World Health Organisation Quality of Life Scale Brief Version; 4. FSSQ: Functional Social Support Questionnaire; 5. CAN: Camberwell Assessment of Needs

SD: standard deviation; r: effect size; ↑: higher scores in the CM programme group; ↓: lower scores in the CM programme group

Table 4. Variables that better classify patient assignment to case management

			95% CI for Exp (B)		
	B (SE)	p	Lower	Exp B	Upper
Included					
Constant	0.725(1.622)	0.665		2.065	
Educational level					
Higher vs. no education	0.564(0.664)	0.396	0.478	1.757	6.458
Higher vs. primary	0.360(0.485)	0.458	0.554	1.434	3.708
Higher vs. secondary	1.318(0.483)	0.006	1.449	3.735	9.628
Positive psychiatric symptoms (PANSS positive)	0.081(0.045)	0.074	0.992	1.085	1.185
Physical health (WHOQOL-BREF, physical health)	–0.238(0.113)	0.035	0.632	0.789	0.984
Needs from the clinicians' point of view (CAN needs)	0.107(0.055)	0.050	1.000	1.113	1.238
Community nursing visits	0.096(0.027)	0.000	1.045	1.1045	1.160
Social services visits	–2.316(0.741)	0.002	0.023	0.099	0.421

Note: R^2= .211 (Hosmer & Lemeshow).

CI: Confidence Interval; Exp B: Exponentiation of the Beta coefficient; B: Beta coefficient; SE: Standard Error

WHOQOL-BREF: World Health Organisation Quality of Life Scale Brief Version; CAN: Camberwell Assessment of Needs