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Case management for schizophrenic patients at risk for rehospitalization: a case control study

Abstract In many countries deinstitutionalization of psychiatric patients is accompanied by fragmentation of care, giving responsibility to an array of different services and providers. One of the possible side effects of this is an increased rehospitalization rate and length of stay. The need to coordinate the services involved for the benefit of individuals has led to the conceptual development of case management. However, despite an apparent belief in the effectiveness of case management, there is only limited scientific evidence to support this assumption. In the case control study presented we compared a group of 97 schizophrenic patients in the aftercare of case management services with a group of patients who received no outpatient care by case management services after discharge from hospital. Each patient in the case-managed group was exactly matched with a control patient with regard to diagnosis and known risk factors for rehospitalization. Additionally, we considered influencing factors that result from general health system conditions such as regional differences and different types of hospital care. Our analyses demonstrate that, during an observation period of 2.5 years, case management had neither a significant effect on the risk of rehospitalization nor on the length of time in hospital in the event of rehospitalization.

Introduction

One of the major challenges of psychiatry worldwide is the development of community-based treatment and support programms for the chronically mentally ill. However, the needs of people suffering from chronic mental illness, often associated with disabilities and multiple psychosocial problems, extend beyond the boundaries of the mental health system. Once discharged into the community they are frequently in need of a broad array of health and social service agencies. The development of such comprehensive community-based service delivery systems has simultaneously led to fragmentation of care, giving responsiblity to a number of different services and providers (Audit Commission 1986). One of the assumed side effects of this is an increase in rehospitalization and, in the event of hospitalization an increased length of stay. The need to coordinate these fragmentary services for the benefit of individuals has led to the conceptual development of case management (Holloway 1991).

In the past decade case management has gained great popularity, although there is no consensual agreement on the term "case management" (Bachrach 1989, 1992). More recently, the following terms were used to describe models of case management: brokering model, assertive case management, intensive case management, rehabilitation-oriented case management and clinical case management (Bachrach 1989; Bond et al. 1988; Kanter 1989; Lamb 1980). Bachrach (1992) arranged the existing approaches to case management along a continuum reflecting the extent of a case manager's clinical involvement with patients. At one extreme is the so-called brokering approach, and at the opposite pole of the continuum is the clinical or intensive case management approach. The key elements of the brokering approach are the assessment of patient needs, the development of comprehensive service plans for the patients and arrangement of service delivery (Clifford and Craig 1988; Renshaw 1987; Lamb 1980). Intensive or clinical case management models also include the provision of support to families, assistance in developing a social support network and training in developing independent living skills (Harris and Bergman 1988). The different models proposed provide these elements to varying degrees (Solomon 1992; Holloway 1991). According to Bachrach (1992) case management appears to be moving increasingly towards the clinical pole with intensified clinical involvement of case managers.

Currently, case management services are accepted as an indispensable element in community support systems for mentally handicapped and chronically mentally ill.

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This is not only true for the United States, but also for Europe. Thus, the concept of case management has recently become part of the British government policy for community care (HMSO 1989). British government community care policy places responsibility for the "social" aspects of community care onto social services authorities who are expected to set up case management services. At the same time, health authorities are to develop a "care programme" approach to vulnerable patients (Holloway 1991). Also, in Germany the importance of service coordination has been recognized (Deutscher Bundestag 1975). Since 1975 the Federal Government has sponsored several community support programms promoting better service coordination (BMJFFG 1988). This has led to the implementation of a great number of case management services named social-psychiatric services (Rössler 1992).

However, despite this apparent belief in the effectiveness of case management, there is only limited scientific evidence to support this assumption (Holloway 1991; Steinwachs et al. 1992). Most models of case management identified have had little or no rigorous empirical testing regarding outcomes. Two recently published articles reviewed several studies on the effectiveness of case management (Rubin 1992; Solomon 1992). Rubin (1992, p. 138) concluded "... the hypothesis that case management is effective remains plausible, but conclusive claims that its efficacy has been empirically demonstrated, are premature".

In fact, the results on the efficacy of case management are inconsistent. This partly reflects a differing quality of applied research designs. Early studies especially used designs with severe limitations or were exploratory (Rubin 1992). Furthermore, even if there are many uncertainties about the efficacy of case management services, the care offered by case management services is widely accepted. Thus, for ethical reasons a strict random assignment of a case management service with regard to a control condition is often not possible. Therefore, most previous studies claiming to have conducted an experimental or quasi-experimental study also have severe limitations with regard to random assignment. Additionally, the results of some recently conducted experimental or quasi-experimental studies are difficult to interpret, because they often focus on heterogeneous, poorly defined case-mix groups of patients with severe mental diseases, rather than on strictly defined diagnostic groups. But conclusive causal inferences are not possible when the comparability of experimental and control group is not secured.

Further inconsistencies result from different outcome measures. Some commonly assessed outcome measures are different aspects of quality of life, social skills, occupational/vocational functioning, residential stability, independence in living, network size, use of chemical substances and compliance with medication. Other authors have examined legal contacts, police contacts or arrests and so on. Almost all studies have employed rehospitalization or length of hospitalization as outcome criteria. The attractiveness of the latter criteria results from the fact that they are reliable and easy to assess. There is also no doubt that a number of programmes put great emphasis on preventing hospitalization.

Finally, it is often not clearly stated which case management activities were provided and to what extent. This is problematic as there is a considerable diversity in the ways case management is conceptualized and implemented. Furthermore, the tasks that case managers perform often depend less on the intended case management model and more on the national or regional service delivery system in which case managers operate. Additionally, the provision of services differs between urban and rural areas. Thus, in often poorly supplied rural areas, we have to take into consideration the inverse relation between admission rates to psychiatric hospitals and the residential distance to these hospitals (Breaky and Kaminsky 1982; Weiss et al. 1967; Weyerer and Dilling 1978) or between residential distance from, and utilization of, outpatient services (Breaky and Kaminsky 1982; Vaslamatzis et al. 1987; Rössler et al. 1991). Therefore, it comes as no surprise that much of the research on case management has focused on process rather than outcome, and has identified numerous problems in the way case management is being defined and implemented (Rubin 1992).

Design and sampling

To overcome some of the discussed methodological problems in our own study on the efficacy of case management, we used a case control design where each case-managed patient was exactly matched with a control patient with regard to known risk factors for rehospitalization. Thus, in a case control study it is possible to control for a number of factors that, apart from case management, can possibly also influence the outcome. Because we used rate and length of rehospitalization as outcome criteria, we had to control for factors known to influence these variables. In this case known risk factors are, for example, diagnosis, gender, age, living conditions after discharge and the number of previous inpatient episodes (Fabrega et al. 1991). Furthermore, these sociodemographic variables represent some of the best assessed predictors of the course of the schizophrenic disease (Vaillant 1964; Henisz 1966; Stephens et al. 1966; Jonsson and Nyman 1984; Biehl et al. 1986; Carpenter and Strauss 1991).

For all patients (including the patients referred to case management services) diagnosis and a sociodemographic data set were recorded before discharge from hospital. This allowed us to identify for each case-managed patient a pairwise matched control patient who did not utilize a case management service after discharge, but who was identical in diagnosis and the above-named risk factors for rehospitalization, i.e. gender, age, living conditions after discharge and the number of previous inpatient episodes. Patients already cared for by the studied case management services before their key admission were excluded from sampling. As it was recorded if a patient was referred from hospital to one of the case management ser-

vices, patients who were referred but did not comply were also excluded from sampling for the control group. Additionally, we knew from a previous evaluation that utilizers of case management services are not willing to accept a travel time to the case management services exceeding half an hour (Rössler et al. 1987). Therefore, mostly patients living close to the studied case management services were referred to these services. Thus, the controls could be chosen from the remaining group of schizophrenic patients living in the catchment area. This sampling procedure makes a systematic selection bias between case-managed and control patients unlikely.

The aim of our study was to compare a group of patients in the aftercare of case management services (case-managed group) with a group of patients matched along these lines who received *no* outpatient care from case management services after discharge (control group). This allowed us to estimate the impact of case management services. For the case-managed group we expected:

1. A lower rate of rehospitalization
2. A longer period in the community between two inpatient episodes
3. A reduced length of stay in the event of rehospitalization.

To rule out geographical influences as far as possible we conducted this study in mixed urban-rural areas where different types of hospital care were provided.

Patients and methods

We analyzed the utilization data of four case management services, each responsible for a defined catchment area. These newly established case management services were part of a community support programe for the chronically mentally ill, initiated by the German Federal State of Baden-Württemberg[1]. On average, each of these case management services was staffed with four social workers experienced in psychiatry and regularly supervised by psychiatrists. The designated aims and objectives were predominantly intensive or clinical case management for chronically mentally ill people, especially for those discharged from psychiatric hospitals. Thus, their activities went beyond a mere broker model of linking and referring a patient to needed services. In a framework of assertive outreach they provided intensive or clinical case management broadly comparable to the social services case management approach in the U.K. including the provision of support to families, assistance in developing a social support network and training in developing independent living skills. Because the studied services did not provide psychiatric treatment, i.e. primarily medication, they were mandated to work closely together with medical inpatient and outpatient services to prevent (re-) hospitalization. Thus, 85% of schizophrenic patients referred to the studied case management services from psychiatric hospitals were in psychiatric outpatient treatment.

The four catchment areas included are part of the Federal State of Baden-Würtemberg, a state with mixed urban-rural areas. The demographic characteristics of the catchment areas, its community support systems as well as the federal mental health service delivery system are described in detail elsewhere (Rössler et al. 1992).

[1] The community support programme for the chronically mentally ill, including the implementation of 41 psychiatric community services and their scientific evaluation (Head: W. Rössler), was funded by the Ministry of Health, Labour and Social Affairs Baden-Württemberg between 1982 and 1987.

Overall, the delivery care systems of the studied catchment areas reflect the highly complex structure of health and welfare systems in industrialized countries. Nevertheless, there is a definite decline in the density of the professional network between urban and rural areas (Rössler et al. 1987).

From January 1984, until June 30, 1986, 7936 patients, of whom 23.2% had a diagnosis of schizophrenia (ICD-9), were discharged from all seven psychiatric hospitals in the studied catchment areas. Of the schizophrenic patients, 49.6% had a diagnosis of schizophrenia, paranoid type (295.3), 16.5% a schizophrenic residual state (295.6), 15.5% a schizoaffective type (295.7) and 6.1% a hebephrenic type (295.1). The remaining subtypes of ICD-9 295.x, 297.x and 298.x comprise 12.3%. Patients were diagnosed by the psychiatrists in charge at the end of hospitalization.

ICD was introduced in all psychiatric hospitals of this federal state more than 20 years ago. There is also a long tradition in Germany of diagnosing schizophrenia according to first-rank symptoms. Although there was no external validation of the diagnosis, we can assume a reliable standard between the participating psychiatric hospitals.

Of the discharged schizophrenic patients, 97 made their first contact with one of the four case management services immediately after discharge. By means of survival techniques (using SPSS-X) we compared the two groups with regard to

1. Length of key hospitalization
2. Survival time in the community after discharge
3. Length of the second hospitalization for those rehospitalized.

The survival techniques, originally developed for the analysis of life tables, can be used for all problems in which the dependent variable is the interval between an initial and a termination event. For example, the interval can be the survival time in the community between discharge from psychiatric hospital and readmission to inpatient treatment. The survival function is the estimated cumulative probability of patients to "survive" from the beginning to the nth time point of the interval without termination event. Censored observations mean that in some cases the termination event does not occur within the investigation period. In these cases the survival time is the interval investigated.

Results

Table 1 shows the characteristics of the two samples compared. Both comprise 97 patients: 97 patients referred to case management services and 97 individually matched controls. With regard to the ICD-9 schizophrenia subgroups, 51.8% had a diagnosis of schizophrenia paranoid type (295.3), 15.7% had a schizophrenic residual state (295.6), 13.3% a schizoaffective type (295.7) and 8.4% had a hebephrenic type (295.1). The remaining subtypes (295.x, 297.x and 298.x) comprise 10.8%. Thus, case-managed and control group are comparable to the total inpatient population with a diagnosis of schizophrenia with regard to ICD-9 schizophrenia subtypes. Comparing the sociodemographic variables, the studied population includes more females, younger patients of whom more are living alone. More of them have also not experienced previous hospitalization.

Table 2 shows the face-to-face activities of the case management services. The care offered for the case-managed patients was intensive: 29.5% were contacted more than 8 times, 19.1% between 5 and 8 times a month. Assessment, planning and counseling was the basis of case management for about 90%. Of the patients, 71.9% were visited at home, 11.3% more than 8 times monthly. Generally, the studied services displayed the whole array of intensive case management activities.

Table 1 Patient characteristics: identical for case-managed group (CM; n = 97) and control group (n = 97) compared with total inpatient population with the diagnosis of schizophrenia

Patient characteristics		n	Straddles (CM/control)	Percent (Total population)
Gender	Male	43	44.3	48.3
	Female	54	55.7	51.7
Age (years)	< 25	18	18.6	14.3
	25–44	58	59.8	52.8
	45–64	18	18.6	27.6
	> 64	3	3.1	0.8
Living conditions	Living alone	28	29.2	19.5
	Living in family	54	56.3	71.6
	No fixed abode	14	14.6	0.8
	Unknown	–	–	1.6
Number of previous inpatient episodes	0	27	27.8	14.9
	1–2	31	32.0	31.2
	3–5	19	19.6	25.7
	> 5	20	20.6	25.3
	Unknown	–	–	2.9

Table 2 Face-to-face activities (%) for case-managed patients

Kind of intervention	Number of monthly interventions (%)					
	0	1	2	3–4	5–8	> 8
Frequency of contacts	–	4.5	16.8	38.0	19.1	29.5
Assessment, planning, counseling	9.8	17.7	23.8	27.5	7.4	13.8
Training in independent living skills	37.0	23.8	12.6	12.3	2.1	12.3
Coordination of professional support	25.1	30.2	19.1	9.8	3.8	12.1
Consultation with relatives	34.3	27.4	14.7	10.9	1.9	10.8
Maintenance and expansion of social networks	54.7	19.4	7.7	5.1	1.5	11.5
Home visits	28.1	25.8	20.9	11.7	2.1	11.3
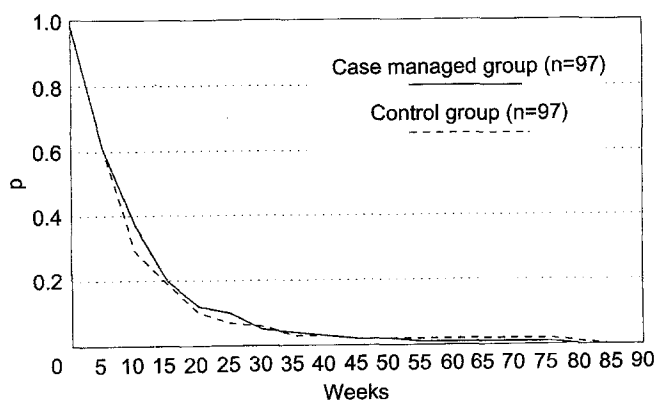
Fig. 1 Comparison of length of key hospitalization

Fig. 2 Comparison of "survival time" in the community

Figure 1 shows the first survival analysis for the two samples with regard to the length of the key hospitalization. On the abscissa, the analyzed time period is marked in weeks. The ordinate shows the probability (p) of remaining in hospital.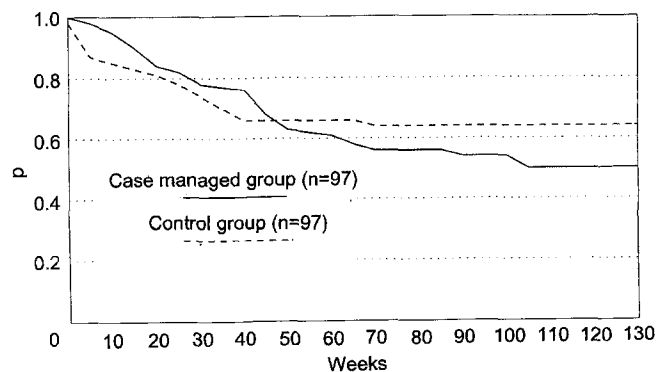 For example, the probability of still being in hospital 5 weeks after admission is $P \geq 0.61$ for the case-managed group and $P \geq 0.59$ for the control group. There are no significant differences in the total length of key hospitalization (1 df; $P \leq 0.47$) between the two samples.

Table 3 Comparison of two subgroups rehospitalized with regard to their risk factors for rehospitalization

Characteristics		Case-managed patients (n = 37)		Control patients (n = 29)	
		n	%	n	%
Gender[a]	Male	17	44.7	12	41.4
	Female	21	55.3	17	58.6
Age (years)[b]	< 25	7	18.4	6	20.7
	25–44	23	60.5	20	69.0
	45–64	7	18.4	3	10.3
	> 64	1	2.6	–	–
Living conditions[c]	Living alone	15	39.5	7	25.0
	Living in family	18	47.4	19	67.9
	No fixed abode	5	13.2	2	7.1
	Unknown	–	–	1	
Number of previous inpatient episodes[d]	0	8	21.1	7	24.1
	1–2	9	23.7	8	27.6
	3–5	10	26.3	8	27.6
	> 5	11	28.9	6	20.7
	Unknown	–	–	–	–

[a] χ^2 1 df $P \le 0.98$
[b] χ^2 3 df $P \le 0.64$
[c] χ^2 3 df $P \le 0.25$
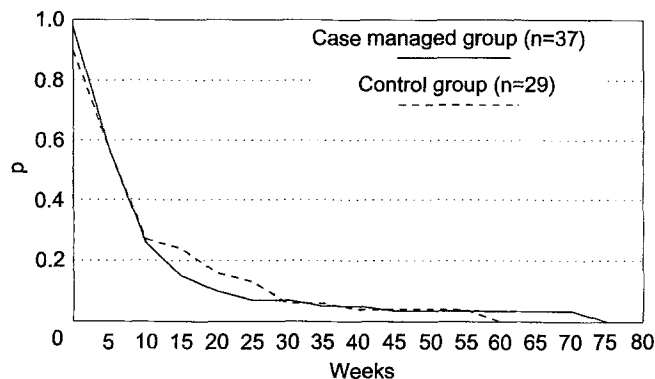[d] χ^2 3 df $P \le 0.89$

Fig. 3 Comparison of two subgroups rehospitalized with regard to the length of second hospitalization

In Fig. 2 the survival time in the community after discharge is compared for the two samples. The observation period was 2.5 years. For the case-managed group there is a higher probability of remaining in the community during the first 40 weeks and a lower probability after the 40th week. However, there is no significant difference in the total length of time in the community (1 df; $P \le 0.81$).

During the observation period 39.2% of the case-managed patients were rehospitalized, but only 29.2% of the controls. In the next step we compared the length of the second hospitalization of those subgroups. Because the rehospitalized patients from both samples were no longer matched regarding their risk factors for rehospitalization, we first took a fresh look at the patient characteristics described herein (Table 3). There were no significant differences between the two rehospitalized groups, also with regard to schizophrenia subtypes (1 df; $P \le 0.69$). A comparison of these two subgroups with regard to the length of key hospitalization also showed no significant differences (1 df; $P \le 0.14$). A final comparison between the case-managed and non-case-managed subgroups with regard to the length of their second hospitalization did not reveal significant differences (1 df; $P \le 0.63$).

Discussion

Case management has been introduced worldwide to improve service delivery and put emphasis on tailoring services to individual patient need (Renshaw 1988). One aim of effective case management is to reduce the rate of unnecessary (re-)hospitalization as well as the length of time in hospital in the case of rehospitalization. For these outcome criteria there is a slight imbalance in favour of positive results for case-managed patients in the literature. But the evaluation period of many case-management studies often does not exceed 1 year and there is a tendency towards more negative results when follow-up periods are longer (Rubin 1992; Solomon 1992).

Our analyses demonstrate that, during an observation period of 2.5 years, case management had neither a significant effect on the risk of rehospitalization nor on the length of time in hospital in the event of rehospitalization. Rather, it seems that intensive case management can keep patients in the community up to a certain point, after which a rebound effect of increased rehospitalization can be observed (Fig. 2), so that the cumulative survival time in the community does not differ anymore between case-managed and control patients.

These results have to be viewed against the background of intensive case management activities by the studied services. Therefore, the case load of the studied case management services is very low – a phenomenon well known from other case management services (Thornicroft 1990). Furthermore, comparing the sociodemographic characteristics of our samples with the characteristics of the total sample of hospitalized schizophrenic patients, one gains the impression that the younger patients with fewer hospitalizations are more often the ones re-

ferred to case management services – sociodemographic predictors of a favourable course of the schizophrenic disease. But as the controls display the same characteristics as the case-managed patients, this does not affect our results.

Thus, considering the efforts as well as the costs of case management services, the results seem to be discouraging at first sight. However, for a more careful interpretation, we want to discuss the advantages and shortcomings of our study and, integrating our results into the reviewed literature, also of other studies with similar results.

In comparison with many previous studies, our design has some advantages. In the first place, a case control design seems to be an adequate approach for enabling mental health services research to avoid some of the above-mentioned problems of experimental studies. Furthermore, as we have stated previously, one of the pitfalls of previous case management studies has been the lack of a clear sample definition. Diagnostic categories such as "major mental illness", "psychotic diagnosis", "serious or severe mental illness" or "psychiatric problem" do not allow for clear statements on the course of the illness or the risk of hospitalization. A clear-cut diagnosis, on the other hand, allows for a reliable selection of controls. In contrast to a previous evaluation of a case-mix population (Rössler et al. 1992), we therefore restricted our anlayses to a well-defined group of schizophrenic patients.

When selecting the samples we chose well-known sociodemographic and disease-related characteristics as indicators for the risk of rehospitalization. Additionally, we matched case-managed and control group with regard to schizophrenia subtypes. To our knowledge, other case management studies have not used comparable thoroughness in choosing control groups. Nevertheless, we cannot be sure about the true extent of disability or chronicity in the patients of both groups, because the subtypes and proxies chosen might be too rough. But we should be aware that these particular proxies are widely accepted and successfully used in mental health services research. Furthermore, the proxies chosen represent the best researched predictors of the course of the schizophrenic disease.

Aside from methodological issues, there are other problems influencing hospitalization, e.g. the diversity in the way case management is interpreted and implemented. Thus, regional differences imply the use of different case management models. Coordination activities will be preferred where professional support is available, as in urban areas, whereas individual interventions will be more likely to be provided in rural areas with less professional support. Regional factors are also highly correlated with the availability and the utilization of health services. Because our investigation was carried out in mixed urban-rural catchment areas, where such influences were balanced, we can assume that in our study – compared with other case management studies – all different case management activities were displayed. Therefore, the type of case management provided presumably did not have a major influence on the chosen outcome criterion.

Because the hospital type provided has a decisive impact on the use of hospital care and on the length of hospitalization, we also included catchment areas with different types of hospital care. Thus, at least to some extent we could also rule out intervening variables such as the distance to and from mental health services and the influences of less comprehensive community support systems in rural areas on the implemented case management models, and thereby on hospitalization.

But there are some critical points in our study that have to be discussed. Firstly, we want to consider some methodological aspects. In the sampling process we had excluded control patients who were referred to a case management service, but did not comply. Nevertheless, the utilization of social and medical services is voluntary. The frequency of compulsory admission lies below 5% of all admissions to psychiatric inpatient treatment in this state (Riecher et al. 1991). Thus, the comparably "good" outcome in the control group could partly be due to patients' reluctance to seek professional help including hospital treatment. Indeed, we have to deal more frequently with problem patients who do not utilize the psychiatric care system according to their needs (Bachrach et al. 1987). This does not mean that this group is not in need of care. Some patients who are hostile and uncooperative with mental health professionals just disappear from our records.

Secondly, we have to consider that we did not control for medication, and as we know from numerous studies, medication has a decisive impact on the rehospitalization rate of schizophrenic patients. On the other hand, 85% of the case-managed patients were in psychiatric treatment. Because there was no significant change in the number of patients under psychiatric treatment during case management, psychiatric treatment as a correlate for medication therefore probably cannot help us to explain why this social services case management approach does not reduce the rehospitalization rate.

Furthermore, we want to discuss some general problems of interpreting results in this complex research. During deinstitutionalization one major objective of psychiatric reforms was to reduce the number of psychiatric beds. Psychiatric hospitals were not supposed to serve as total care institutions any longer, but to focus mainly on psychiatric treatment. According to WHO a bed ratio of 0.7 beds per 1000 inhabitants – as is provided in the federal state of Baden-Württemberg – is one of the lowest in industrialized countries (Freeman et al. 1985). In 1984 the average length of hospitalization in Baden-Württemberg was 59 days in a state mental hospital and 33 days in a psychiatric department. This is a relatively short period as compared with the traditional length of hospitalization. Because these figures have proven to be constant in the 1980s (Rössler et al. 1987), it is doubtful that the time of hospitalization in this state can be decisively further reduced, even if intensive outpatient care including case management is provided. Therefore, "length of hospitalization" might not be a very valid outcome indicator anymore.

Also, the outcome indicator "rehospitalization" has to be questioned. Some of the characteristics of the examined

samples indicate that case management services deal with problem patients. One name given to these problem patients is "system misfits" (Beeson 1983; Johansen 1983), expressing that our care system cannot meet the needs of these patients. With regard to this patient group, it is easily understandable that intensive professional support for these patients can increase, rather than decrease, the probability of getting referred to a psychiatric hospital, especially because one core element of case management is the linkage with resources, e.g. also hospitals. Thus, a higher rehospitalization rate might even indicate improved quality of care.

Further aspects have been mentioned in the literature. Franklin et al. (1978) claimed that a high level of resources may have made case management unnecessary, and therefore may have diluted the expected differences between case-managed and non-case-managed clients. Fisher et al. (1988) interpreted their equally negative findings quite differently. They found that case managers' *referral resources* were often unavailable or in poor supply, which they felt to be the main reason for the lacking efficacy. Thus, the question of the efficacy of case management also has to be regarded in the context of either resource-rich or resource-poor situations (Rubin 1992). Considering the results of our study we could also – at least in part – attribute our negative findings to the availability of resources due to our well-equipped health care system.

Wing, considering the development of community care, concluded (1991, p. 13): "There has been no major advance in the theory or practice of psychosocial methods, of treatment, enabling care or support during the past 30 years". Case management is a *new* psychosocial method. The question of whether it can bring *major advance* has not been definitely answered yet for a variety of methodological reasons. We might especially have to ask ourselves whether we are using the appropriate outcome criteria for measuring the efficacy of case management. Thus, for some patients with severe mental illness, repeated rehospitalization for short periods might prevent severe exacerbation or disability with all its known consequences ranging, e.g., from suicide or homelessness on the one hand, to long-term hospitalization on the other hand.

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