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ORIGINAL PAPER

Preventing compulsory admission to psychiatric inpatient care using psycho-education and monitoring: feasibility and outcomes after 12 months

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Abstract The aim of this study was to evaluate an intervention programme for people with severe mental illness that targets the reduction in compulsory psychiatric admissions. In the current study, we examine the feasibility of retaining patients in this programme and compare outcomes over the first 12 months to those after treatment as usual (TAU). Study participants were recruited in four psychiatric hospitals in the Canton of Zurich, Switzerland. Patients were eligible if they had at least one compulsory admission during the past 24 months. Participants were assigned at random to the intervention or to the TAU group. The intervention programme consists of individualised psycho-education focusing on behaviours prior to illness-related crisis, crisis cards and, after discharge from the psychiatric hospital, a 24-month preventive monitoring. In total, 238 (of 756 approached) inpatients were included in the trial. After 12 months, 80 (67.2 %) in the intervention group and 102 (85.7 %) in the TAU group were still participating in the trial. Of these, 22.5 % in the intervention group (35.3 % TAU) had been compulsorily readmitted to psychiatry; results suggest a significantly lower number of compulsory readmissions per patient (0.3 intervention; 0.7 TAU). Dropouts are characterised by younger age and unemployment. This interim analysis suggests beneficial effects of this intervention for targeted psychiatric patients.

Keywords Involuntary placement · Psychiatric rehospitalisation · Prevention · Randomised controlled trial · Evaluation

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Introduction

While indispensable as an ultimate means to protect mentally ill persons dangerous to themselves and/or others, involuntary hospitalisation does affect a person's civil liberties profoundly. Compulsory hospitalisation constitutes a serious restriction in a person's freedom and may be perceived by a patient as unjustified, harmful [1] or unfair [2]. Moreover, it may affect the therapist–patient relationship adversely and be associated with a negative treatment outcome [3, 4]. Beyond the ethical and personal relevance of these problems, the fact that the way mental health services handle custodial measures varies considerably raises further concerns [5, 6]. Compared to other European countries, Switzerland, for example, has one of the highest rates of compulsory admission to psychiatric inpatient care [7, 8]. If the number of involuntary admissions could be reduced by applying appropriate preventative measures, this would lead not only to a decrease in the patients' subjective experience of coercion. Considering that inpatient care constitutes a huge expense factor in mental health care, prevention of compulsory hospitalisation also might be beneficial in terms of healthcare costs [9].

Up until now, there is a lack of innovative interventions which, applied prior to a mental health crisis, target the risk of compulsory admission. A number of promising approaches have been proposed; indeed, psycho-educational programmes, for example, appear to be eligible inasmuch as they might enhance compliance with psychiatric treatment and focus on risk factors for crises and threatening relapse [10]. Efforts to increase self-management skills and self-efficacy of psychiatric patients, too, have been suggested by health psychology, stressing that it is in the patient's interest to avert losing autonomy [11].

Other than in joint crisis plans, which pursue similar objectives [12–14], the effectiveness of such healthcare strategies targeting the prevention of compulsory hospitalisation, however, has not yet been investigated in larger patient samples.

In this paper, we report the 12-month outcome of a prospective controlled trial that is currently being conducted at four psychiatric hospitals in the Canton of Zurich, Switzerland. The aim of this study is to evaluate an intervention programme to prevent compulsory readmission to psychiatric inpatient treatment in high-risk patients. Primary outcome of the study is the time in hospital accumulated over all involuntary inpatient stays during the 24-month period. Furthermore, the intervention tends to increase patients' empowerment and treatment satisfaction and to decrease their perceived coercion. The intervention programme consists of individualised psycho-education focusing on behaviours prior to or during an illness-related crisis, crisis cards and, after discharge from the hospital, a 24-month preventive monitoring of individual risk factors for compulsory readmission to psychiatry. In order to prove its effectiveness, outcomes of the intervention will be compared to those of standard care procedures, i.e. regular outpatient or inpatient mental health care on completion of the programme.

The study is implemented as a sub-project within the framework of the Zurich Programme for Sustainable Development of Mental Health Services (ZInEP), intending to interface mental health research and care [15]. ZInEP is funded by a private donation. The donator had no role in the study design or the collection, analysis and interpretation of data.

In the present interim analysis, we seek to explore outcomes after the first 12 months of the trial. In particular, this analysis aims (1) to evaluate the rate of *compulsory* and of *voluntary readmissions* to psychiatric hospital treatment over the first 12 months of the programme to determine its short-term effectiveness and (2) to analyse dropout during the first 12 months in order to better understand the factors which are crucial for retention in such a long-term intervention programme.

Subjects and methods

Study design

The design of the study and the intervention programme are described in detail elsewhere [16]. In short, study participants, after having given informed consent, were randomised to the intervention group (intervention) or a treatment as usual (TAU) comparison group. To evaluate the programme, the study encompasses a detailed baseline assessment during the inpatient episode (t0) and follow-ups 12 (t1) and 24 months (t2) after discharge from the hospital. Data on service use, psychopathology and patients' perceptions are gathered by means of face-to-face interviews and questionnaires.

The study protocol received ethical approval by the Ethical Review Board for Clinical Studies of Canton Zurich, Switzerland, and is registered with Current Controlled Trials ISRCTN63162737.

Sample

The study sample was recruited from a naturalistic user sample from four psychiatric hospitals, all mandated to provide psychiatric care to adult patients in the Canton of Zurich. Inclusion criteria were as follows: one or multiple compulsory admissions to psychiatry during the past 24 months, age 18–65 and current place of residence in the Canton of Zurich. Patients who could not be contacted by telephone and those with insufficient language skills, however, were not eligible for inclusion. Furthermore, we excluded patients diagnosed with an organic mental disorder (ICD-10: F0), mental retardation (F7) or a behavioural syndrome associated with physical factors (F5).

Study participants were recruited by four (50 % part-time) mental healthcare workers (psychologists) between April 2010 and July 2012.

Intervention

The concept of this intervention is that of an outreach programme starting at the interface of inpatient and outpatient care that comprises a long-term monitoring at close intervals. The underlying idea of this programme draws on a patient-centred model advocating principles of patient autonomy and patient involvement. It is based on the expectation that delivery of a service by an expert *not involved* in treatment (and not associated with prior commitment) may help to activate motivation and provide assistance for people with serious mental illness to help themselves. It is supposed that a compulsorily hospitalised patient strives to avoid further compulsory hospitalisation and that dealing with his/her former experiences around mental health problems, wants, preferences, reasons and personal resources will promote self-empowerment.

The intervention programme started with individualised psycho-education focusing on behaviours prior to and during an illness-related crisis by the personal mental healthcare worker who maintained the contact to the study participant over the course of the whole programme. The instruction sessions were adapted according to the patient's illness-related prior knowledge, his/her personal needs, mental ability and condition during the sessions. The

number of instruction sessions provided ranged between 1 and 11 (mean 2.5 ± 1.3). On average, the duration of the sessions was 3–4 h in total (mean 3.4 ± 1.3). The key issues discussed covered personal resources and skills, social network and social support, living arrangements, occupational situation and means of subsistence. Further topics to be addressed were the participant's physical health, substance abuse, violence, offences and suicidal ideation.

Prior to discharge, a checklist covering the personal risk factors for relapse (e.g. familial, work or financial problems), personal and social resources as well as information on treatment-related behaviour and use of mental healthcare services was compiled. Based on this information, a crisis card was filled in that includes early signs of a crisis and information on professional or personal contact persons, medication and actions to be taken in case of a serious crisis. It was fully left to the patients to decide in which situation they applied the crisis card and which persons they informed about. As a result, the study participants used their crisis cards in a variety of ways.

After discharge from psychiatry, each participant in the intervention group was contacted every fourth week by telephone over a period of 24 months. The 4-week interval of contacts for preventive monitoring was chosen to provide a dense individual pattern of the course of the illness and the current service utilisation. At each contact, the present mental health status was assessed using the individual checklist and the crisis card. This enabled the personal mental healthcare worker to detect early signs of a crisis or a threatening relapse and offered opportunities to discuss issues (utilisation of healthcare services; medication compliance) or to intervene in case of problems.

The intervention programme primarily addresses the self-management skills of chronically mentally ill patients thus activating their potential for secondary prevention of relapses. It shall not replace the patients' regular therapy, and a structured collaboration between the personal mental healthcare worker and the regular treatment team is not intended. Rather, it is considered as a supplementary measure to enhance chronically mentally ill patients' empowerment by giving them individual support to become more actively involved in their care.

Treatment as usual

Whereas the intervention group received these measures (psycho-education, telephonic monitoring based on the personal checklist and crisis card) *supplementary to* 'treatment as usual', the comparison group received 'treatment as usual' *only*. Standard care implies that a psychiatric inpatient when discharged from the hospital is referred to an outpatient institution or healthcare professional for further treatment. Community mental health care in the Canton of Zurich is well resourced (with 587 psychiatrists in office practice or outpatient services serving a population of circa 1.4 million people [17]), and a wide variety of community mental health services can be accessed.

In general, it is not pursued further, however, whether a patient makes use of the referral and continues treatment; contrariwise, various healthcare providers might be involved at the same time in the patient's care later on. Since the evaluation of this study will be based on a detailed assessment of the utilisation of healthcare and forensic institutions, patients in the control group were called up every 3 months briefly (for evaluation purposes only) in order to assess their service utilisation over the past period.

Measures

Diagnostic data were taken from the patient files. Psychiatric diagnoses were made by the hospital physicians in charge in the participating study centres. In view of the high prevalence of psychiatric co-morbidity in this sample, the diagnostic information on the index episode covered more than one diagnosis in many cases (56.3 % with multiple diagnoses; up to eight different ICD-10 diagnoses recorded in the patient files). Psychiatric diagnoses therefore were categorised as follows: we grouped the study participants according to their main diagnosis as documented at discharge. In patients who had been diagnosed with a personality disorder, we considered the ICD-10 F6 diagnosis as prior-ranking, even if it was not recorded in the first place, in order to take into account the clinical significance and persistence of these conditions and behaviour patterns.

Socio-demographic data are gathered by the mental healthcare workers in a comprehensive face-to-face interview (t0; t1) based on the Client Socio-demographic and Service Receipt Inventory CSSRI-EU [18]. The CSSRI-EU is also used for a detailed assessment of the patient's use of healthcare services during follow-up. Among other treatment-related information, the frequency and lengths of voluntary and involuntary psychiatric inpatient episodes are regularly assessed. These data were cross-checked with and amended by adding information from the clinical patient records of the study centres involved.

Statistical methods

Data were analysed using SPSS 21 and SAS 9.3 procedures. We compared baseline characteristics of the intervention and the TAU group using Chi-square tests

(nominal variables) and nonparametric Mann–Whitney *U* tests (metric variables) to account for skewed data.

To analyse outcomes of the intervention programme, numbers of readmissions (both compulsory and voluntary) and times in hospital were accumulated over all inpatient stays during the period between baseline and t1 assessment. The accumulated outcome data of the intervention and the TAU group were analysed using Mann–Whitney *U* tests.

To determine the significance of baseline patient characteristics and to explore the extent to which these might explain intervention effects, we fitted negative binomial regression models. Negative binomial regression is appropriate for modelling count variables, particularly when the dependent variable is over-dispersed, as was the case for the two outcome measures. In addition to 'treatment group' (intervention = 1, TAU = 0), we considered age, gender and the patient's diagnosis at the index episode as further explanatory variables. The effects of these variables were estimated jointly using SAS PROC GENMOD. To adjust for heterogeneity in the models, we estimated robust standard errors for the negative binomial regression coefficients. Likelihood ratio statistics of these analyses and ML parameter estimates will be reported. The level of significance was set at 0.05, two-tailed.

Results

Recruitment

Of all inpatient admissions assessed for eligibility within the recruitment period, 3,785 were not approached for the following reasons: the patient did not meet the inclusion criteria (925), severe psychopathology made an interview impossible (533), an inpatient readmission of a previously already approached person (502), a discharge before a personal contact had been realised (1,595) or for diverse other reasons (230).

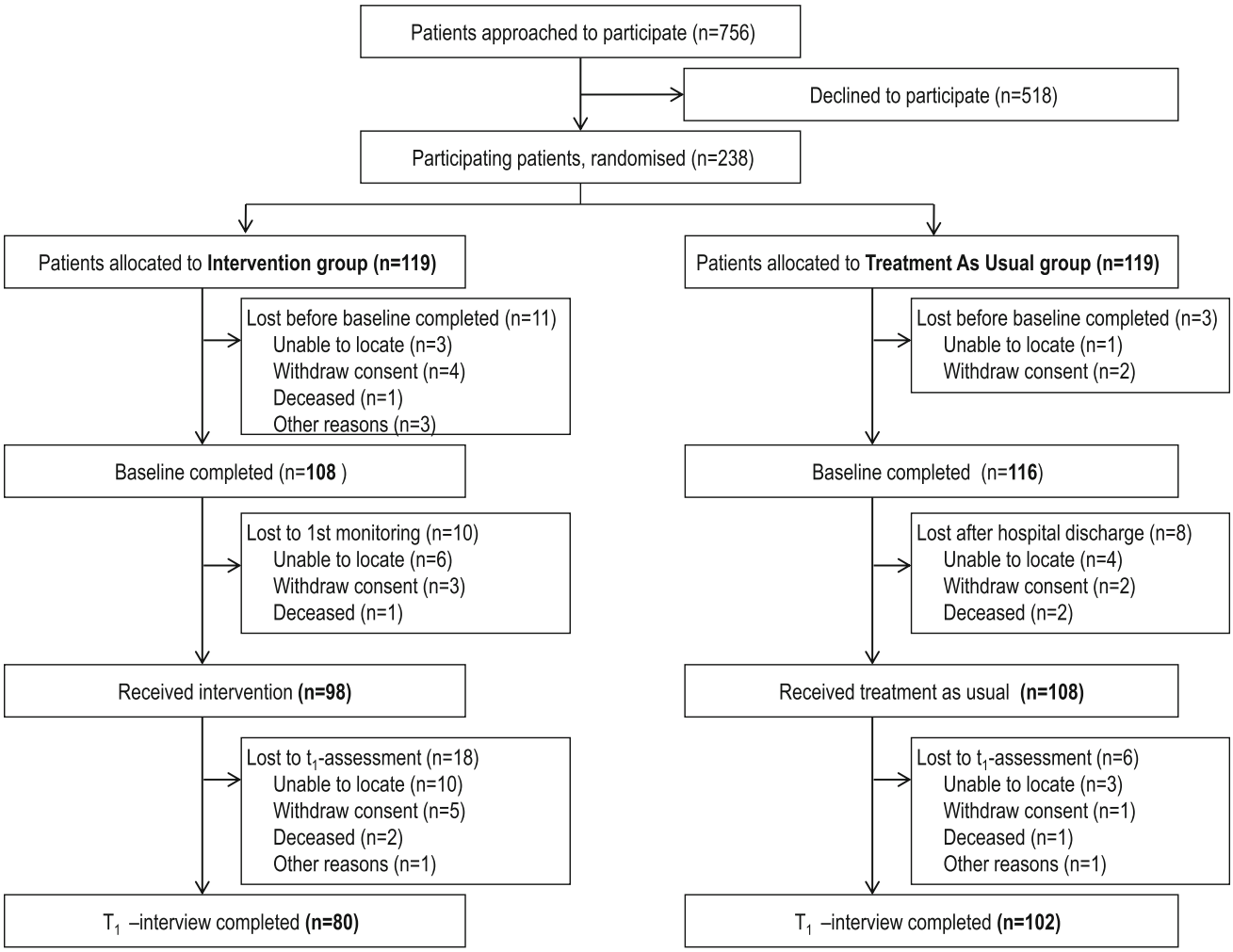

Fig. 1 Study flow chart of participants

Of the 756 psychiatric inpatients who were asked to participate, 238 (31.5 %) provided written informed consent. Main reasons not to participate were as follows: no interest (39.5 %), trial too time-consuming (27.5) or concerns (interviews too stressful; precarious information; 9.8 %). Figure 1 shows the flow chart of the trial up to the 12-month assessment.

Sample characteristics

Baseline characteristics of the intervention and the TAU group are given in Table 1. All in all, the rate of females participating in this study (55.9 %) is higher by trend in both treatment groups ($\chi^2 = 1.38$, 1 *df*, $p = 0.15$). The majority of the study participants (72.7 %) has only a basic education, and the number of unemployed is at a comparable rate: only one in four holds an occupation on the regular labour market, and this rate covers also part-time and small jobs to the extent of only 5 %. Every other study participant had been living alone before hospital admission.

With a mean duration of illness of 16 years, the study includes persons during their first illness episode as well as people suffering from chronic mental illness already for 50 years. Most patients have experienced a high number of previous hospitalisations: up to 90 hospital admissions in the past were documented in the patient files. Accordingly, with mean GAF scores of 39.1, the level of functioning at baseline assessment is suggestive of major functional impairments in several areas.

At baseline, 39.8 % of the intervention group and 37.3 % of the TAU group had experienced their first compulsory admission (lifetime). In both treatment groups, however, up to 52 previous compulsory admissions were registered in individual cases.

The comparison of baseline characteristics did not result in any statistically significant differences between the intervention and the TAU group, except for the main psychiatric diagnosis ($\chi^2 = 11.4$, 5 *df*, $p = 0.04$): we found a higher rate of schizophrenia patients (F2) in the TAU group, whereas a higher number of patients with neurotic and stress-related disorders (F4) had been assigned (randomly) to the intervention group. Overall, schizophrenic disorders are, at 26.5 %, the most prevalent diagnostic group in this sample. Across all diagnostic groups, psychiatric co-morbidity is common: a substance use disorder in addition to another psychiatric main diagnosis, for example, is found in one in three study participants (intervention: 29.4 %; TAU 37.0 %).

Table 1 Baseline sample characteristics

	Intervention $n = 119$	TAU[a] $n = 119$
Gender, *n* (%)		
Female	71 (59.7)	62 (52.1)
Male	48 (40.3)	57 (47.9)
Age, years: Mean ± SD	41.5 ± 12.3	43.4 ± 11.3
Occupation, *n* (%)		
Unemployed/homemaker	87 (73.1)	77 (64.7)
Regular labour market; 5–100 %	25 (21.0)	30 (25.2)
Sheltered employment	7 (5.9)	12 (10.1)
Living situation, *n* (%)		
Alone	53 (44.5)	57 (47.9)
With child(ren)	10 (8.4)	7 (5.9)
With partner/children	28 (23.5)	21 (17.6)
With others/unknown	28 (23.5)	34 (28.6)
Foreign nationals, *n* (%)	20 (16.8)	25 (21.0)
ICD-10 diagnosis[b], *n* (%)		
Substance use disorders (F1)	24 (20.2)	23 (19.3)
Schizophrenia, psychotic disorders (F2)	24 (20.2)	39 (32.8)
Mania, bipolar affective disorders (F30–31)	17 (14.3)	13 (10.9)
Depressive disorders (F32–34)	14 (11.8)	19 (16.0)
Neurotic, stress-related disorders (F4)	22 (18.5)	8 (6.7)
Personality disorders (F6)	18 (15.1)	17 (14.3)
Length of illness, years: Mean ± SD	15.6 ± 12.5	16.7 ± 12.5
Psychiatric hospital admissions, *n*: Mean ± SD	8.5 ± 12.1	9.3 ± 14.4
Compulsory psychiatric admissions, *n*: Mean ± SD	3.8 ± 5.2	4.8 ± 8.5

[a] TAU = treatment as usual

[b] $\chi^2 = 11.45$ (5 *df*) $p = 0.04$

Outcome at t1

All in all, 67.2 % of the intervention group and 85.7 % of the TAU group remained for a period of 12 months in the intervention programme and completed t1 assessments. Data for compulsory and voluntary inpatient readmissions at t1 are shown in Table 2. Over the 12-month period, 52.5 % of the intervention group (56.9 % TAU) had been readmitted to a psychiatric hospital for some time. The cumulative number of readmissions of the 80 patients in the intervention group adds up to 143 overall, meaning 1.8 readmissions per patient on average. In most cases (115 times), the study participants were readmitted voluntarily. With respect to voluntary hospital readmissions, our as-treated analysis reveals no significant differences between the two groups in terms of number and length of voluntary stays.

Compulsory inpatient readmissions were registered in 22.5 % of the intervention group (35.3 % TAU). With a mean number of 0.3 compulsory readmissions per patient during the 12-month period, this is around half the number

Table 2 Inpatient readmissions over 12 months

	Intervention		TAU		*P* value
	n (%)	Mean ± SD	*n* (%)	Mean ± SD	
Sample follow-up characteristics					
T_1 interview completed	80 (67.2)		102 (85.7)		
T_1 dropout	39 (32.8)		17 (14.3)		0.001
Time to t_1 completers, days		378.0 ± 21.1		382.6 ± 33.2	0.55
Time to dropout, days		64.5 ± 97.4		81.7 ± 128.3	0.70
T1 completers, readmission data					
No. of voluntary readmissions per patient		1.4 ± 2.5		0.9 ± 1.4	0.51
Length of voluntary episodes, days		36.0 ± 66.6		33.0 ± 60.0	0.84
No. of compulsory readmissions per patient		**0.3 ± 0.8**		**0.7 ± 1.2**	**0.04**
Length of compulsory episodes, days		**9.1 ± 21.8**		**14.8 ± 31.2**	**0.08**
No. of patients with voluntary readmissions	35 (43.7)		44 (43.1)		1.00
Voluntary readmissions, *n* cumulative	115		96		
Length of voluntary episodes, days cumulative	2,883		3,362		
No. of patients with compulsory readmissions	**18 (22.5)**		**36 (35.3)**		**0.07**
Compulsory readmissions, *n* cumulative	28		70		
Length of compulsory episodes, days cumulative	**729**		**1,510**		

Chi-square tests and Mann–Whitney *U* tests; statistical significant differences in bold

of compulsory readmissions that was found in TAU patients (mean 0.7). Compulsory inpatient episodes in the intervention group tended too to be shorter, compared to those of TAU patients, but this group difference is not statistically significant. The proportion of time (days accumulated over all compulsory stays/days t0–t1) is 0.02 in the intervention group and 0.04 in the TAU group, suggesting that 2 % (and 4 %, respectively) of the time up to t1 has been spent in hospital in connection with compulsory inpatient episodes.

The negative binomial regression model provides further support for a significant treatment effect ('treatment group' $\chi^2 = 4.69$, 1 *df*, $p = 0.03$). Results suggest that the log of *the number of compulsory readmissions* is expected to be reduced in the intervention group by 0.67 (95 % CI −0.06; −1.28). This 'treatment' effect still remains significant ($\chi^2 = 5.16$, 1 *df*, $p = 0.02$) after age, gender and diagnosis are controlled for in the model. Among the latter predictors, however, only the variable 'diagnosis' reveals a significant effect ($\chi^2 = 20.55$, 5 *df*, $p = 0.001$); the remainder (age: $\chi^2 = 1.13$, 1 *df*, $p = 0.29$; gender: $\chi^2 = 0.35$, 1 *df*, $p = 0.55$) do not contribute substantially to the model, given the other predictor variables are held constant.

To illustrate this dissimilarity in diagnoses, the crude rates of compulsory inpatient readmissions within treatment groups are cross-tabulated in Fig. 2 (on the bivariate level), broken down by the six diagnostic groups.

As regards the 'length of compulsory inpatient episodes', we found no significant effect for 'treatment group' in the regression model ($\chi^2 = 0.75$, 1 *df*, $p = 0.39$).

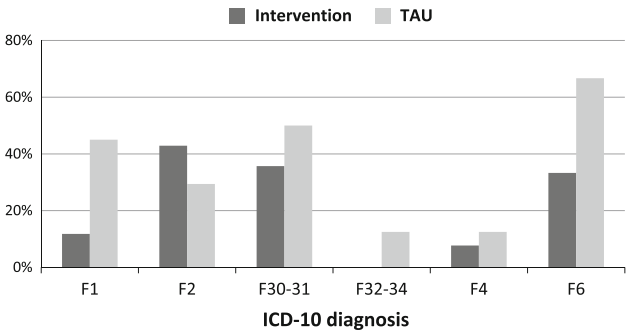

Fig. 2 Percentage of patients with compulsory readmissions within intervention and TAU groups, by ICD-10 diagnosis

Attrition, dropout analysis

We lost more patients up to the t1 assessment in the intervention group (39; 32.8 %) than in the TAU group (17; 14.3 %). Most study participants were lost because they were no longer traceable (19 intervention; 8 TAU); 17 were explicitly no longer willing to participate in the programme (12; 5) or dropped out for other reasons (4; 1). In addition, there were 7 serious adverse events (none of them related to the trial) in that 4 (intervention) and 3 (TAU) patients died during the t1 period.

To further analyse the potential bias due to dropout, we compared baseline characteristics of those with and without complete t1 assessment. In the intervention group, 11 patients had dropped out (for various reasons) before baseline assessments had been completed (Fig. 1). Over the

12-month period, however, there was no significant difference between the treatment groups as to the mean time until (the date of) aborting the programme (Table 2).

The comparison of major socio-demographic background variables such as gender, foreign nationality and living situation (alone, with others) did not reveal any significant difference between participants with complete t1 assessments and dropouts, either. In absolute numbers, the rate of dropout was highest in patients with an F2-(intervention 10; TAU 5), F6-(6; 5) or F1-diagnosis (7; 3), but between-group comparison was not statistically significant.

Compared to the participants staying in the programme for 12 months, the rate of unemployment among dropouts was higher (82.1 vs. 64.8 %; $p = 0.01$). Moreover, they were significantly younger (35.9 vs. 44.4 years; $p < 0.001$) and had a shorter duration of illness (12.7 vs. 17.2 years; $p = 0.01$). Even so, we found no significant difference as to the number of previous hospitalisations ($p = 0.18$) or the rate of previous compulsory admissions ($p = 0.68$).

Discussion

Main findings

After 12 months of preventive monitoring based on a psycho-educative approach targeting the enhancement of patients' empowerment, people with severe mental disorder and previous compulsory psychiatric treatment were less often compulsorily readmitted and spent fewer days in inpatient care in connection with compulsory psychiatric admissions, compared to control patients. This suggests that the trial has beneficial effects for patients who adhere to the intervention programme. Considering that we retained 67 % (intervention group) throughout the programme for 12 months, a patient benefit is to be expected for a substantial proportion of the target sample.

In the intervention group, patients are guided to take a more active role in coping with their mental health problems. This implies that they are admonished to seek treatment according to their personal preferences betimes in case of a crisis. It is therefore plausible that we found a significant effect only with respect to *compulsory* readmission, but not as to the number of *voluntary* psychiatric readmissions.

Recently, three randomised trials have been published that used Joint Crisis Plans (JPC) to reduce compulsory treatment for people with psychosis [9, 19], or, respectively, self-harming behaviour in people with borderline personality disorder [20]. Whereas previous JCP studies had reported promising results in terms of a significant decrease in the number of compulsory admissions [12, 21], they found no evidence of clinical efficacy [19, 20] or of cost-effectiveness [9] of crisis interventions applying JCP. Advance directives, too, are considered as a way to empower consumers to take a more active role in their treatment and have proven positive effects on the patient–clinician working alliance [22]. Despite this, little impact on the outcome of care at 12 months (subsequent compulsory admission) has been found [23]. For a number of methodical and substantive reasons, the results of these studies, however, cannot be directly compared to those of the current trial. In particular, it can be assumed that a one-off intervention offered to a patient might produce less sustainable effects than long-term regular telephonic monitoring that offers opportunities to bring to mind coping strategies and personal resources when necessary in case of a crisis.

In contrast to the JCP studies mentioned, the current trial is not reserved for a specific diagnostic group, but includes a broad spectrum of severe mental disorders. The present findings support the feasibility of this intervention programme also for people with severe mental health problems other than schizophrenia or borderline personality disorder (the latter making up less than half of the sample), namely people with substance use disorders or affective disorders. Moreover, results suggest that the intervention effect is moderated by the patients' psychiatric diagnosis. Particularly in schizophrenia patients, we found less favourable outcomes in terms of both the rate of dropouts and of compulsory readmission.

Feasibility

One out of three persons we informed about the study agreed to participate; 12 months later, the majority of the participants (76 %) is still continuing the programme. This supports the notion that for a considerable quantity of the target population, this programme may be attractive. As we know from the patient interviews, this attractiveness is immediately linked to the opportunity for a patient to reflect on the experience of a compulsory admission, which is often referred to as a very stressful critical incident. The regular discussion with an 'impartial' person who is not directly involved in his/her treatment obviously offers ample benefits, so that these patients are likely to remain in the programme for a longer period of time.

Nevertheless, it should be stressed that considerable efforts had to be made to achieve this result, both as regards the recruitment and the intervention. The recruitment and baseline assessment of study participants in diverse psychiatric hospitals were most time-consuming, especially for organisational reasons (e.g. scheduling of patient contacts), and therefore took longer than anticipated, so we missed our recruitment target. Such difficulties, however, are common and not specific to this

intervention programme [24]. One of the paramount problems we face when trying to contact study participants for telephonic monitoring or personal interviews is the patients' failure to keep appointments. Moreover, a great many additional investigations are necessary if study participants can no longer be traced, thus binding considerable staff capacities, too. It should be mentioned, however, that the assessments in the course of the trial answer the purpose of trial evaluation, but would be dispensable in routine clinical practice.

For the study participants themselves, long-term engagement in a monitoring at such close intervals is challenging, as well. We therefore cannot rule out that this contributed to the higher number of dropouts in the intervention group, compared to the control group. The higher attrition rate in the intervention group is consistent with those of other randomised trials in this field [19, 20], however. There is not much of a difference between patients remaining in the programme and dropouts, however, regarding clinical characteristics or prior psychiatric history; particularly, there is no evidence that we lost the more severely disordered patients. Rather, younger age and unemployment are the strongest risk factors for dropout. This might suggest that people who have difficulty sticking to a job or trouble following rules and getting organised might struggle, too, to follow such an intervention programme. It is also possible that retention in the programme is associated with the patients' insight into mental health problems, which might be less developed at younger ages. A more in-depth analysis is necessary to understand the mediating mechanisms behind the socio-demographic factors related to dropout.

Limitations and strengths

Some limitations of this study have to be mentioned. First, this evaluation is based on an open trial. In contrast to certain experimental conditions, the nature of this intervention programme, however, does not allow a double-blind trial. As regards *the assessment* of our primary outcome criterion, it has to be considered that all objectively verifiable information on service use provided by the patient is validated and, where necessary, is completed by means of administrative data. The necessity to issue a formal attestation makes it highly unlikely that involuntary placements remain undocumented in the electronic patient records. Therefore, it is safe to assume that the results do not underestimate compulsory admissions. Regarding the secondary outcome criteria of this study (e.g. perceived coercion, treatment satisfaction; not analysed here), the kind of information required precludes the objective assessment or 'blind' rating by a third party, because they refer to the patient's personal subjective view.

Second, we failed to obtain the planned sample size of 400 patients, obviously because our recruitment target was too ambitious. This will have implications for the statistical power to detect treatment effects in this and in further analyses in that group differences might remain undetected. Interpretation of these results therefore should be done with caution, and findings should be considered preliminary and not conclusive. Considering that under-recruitment is common in randomised trials [20], research studies should place greater emphasis on the problem of recruitment difficulties.

Third, the present t1-analysis reflects outcomes in patients who completed the first 12 months of the programme. As is the case with all as-treated analyses, this approach undermines randomisation, ignoring that bias might be associated with early departure from the trial. Inferences as to the effectiveness of the whole programme therefore are preliminary and limited to outcomes in a selective sample of participants who can be assumed to qualify for such a programme because of their higher motivation. Based on the present findings, the effectiveness of the treatment probably is overestimated. Fourth, it further should be kept in mind that these are interim results, for the planned primary endpoint of this trial is after 24 months of preventive monitoring. The effectiveness of the programme with respect to primary and secondary outcomes therefore still remains to be proved in the final t2-evaluation.

Despite these limitations, this study has several strengths. The programme is implemented in a real community mental health setting. The present analysis provides a first outline of the feasibility, the use and the potential of such an approach. More than 30 % agreed to participate in this long-term trial, and we retained 76 % in the study during a period of 12 months. Considering the patients' social background and psychiatric diagnosis, this intervention obviously appeals to patients with a broad spectrum of severe psychiatric conditions at risk of compulsory hospitalisation. Moreover, the study suggests which type of patient might be retained in and benefit most by such an intervention programme.

Conclusions

Promoting self-efficacy in people with severe mental disorder with respect to coping strategies and enhancing their empowerment regarding their own care have been proposed to reduce compulsory hospitalisation. Considering that controlled trials in psychiatry targeting the prevention of compulsory hospitalisation are sparse and that there are only few which have shown only modest results in terms of clinical outcomes, the development of innovative strategies is still needed.

The current preventive programme combining elements of psycho-education and crisis cards with a long-term monitoring subsequent to hospital discharge suggests that it is eligible for use among a wide spectrum of psychiatric patients with high risk of compulsory admission. It is feasible to recruit and retain people with severe mental illness in this intervention programme, though great efforts have to be undertaken. Interim results suggest beneficial effects; analyses upon completion of the programme that will determine its effectiveness and cost-effectiveness are still pending.

Conflict of interest The authors declare that they have no conflict of interest.

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