

Inpatient or day clinic treatment? Results of a multi-site-study

Stationäre oder tagesklinische Behandlung? Ergebnisse einer multizentrischen Studie

Abstract

Objective: This naturalistic study aimed to identify criteria which are of relevance for making a decision as to whether inpatient or day hospital treatment is indicated.

Methods: In 567 patients who were consecutively admitted to 10 departments of psychosomatic medicine (day hospital or inpatient setting) in Germany, symptom severity at admission and discharge was measured (Symptom-Check-List-90-R, Global Assessment of Functioning). Before admission, clinicians rated aspects that might be important for differential indication (Rating Scale of Indication Criteria). A regression analysis was conducted to reveal relationships between outcome in each setting and possible predictors (criteria of relevance).

Results: At admission inpatients and day clinic patients already showed some differences referring to aspects clinicians used to select patients for each setting. Good outcome in day hospital patients was associated with a high motivation and higher burdens at home, whereas reduced drive and loss of interest was correlated with a less favourable course. Inpatients did less well if their symptoms were triggered by situations at home and if they showed a high potential for regression.

Conclusion: Results give first hints for criteria which are relevant for making a decision between inpatient and day hospital treatment in psychosomatic medicine.

Keywords: differential indication, inpatients, day clinic, psychosomatics, prediction

Zusammenfassung

Zielsetzung: Es wurde eine naturalistische Studie durchgeführt mit dem Ziel, Kriterien zu identifizieren, welche für eine differentielle Indikationsentscheidung zwischen stationärer und tagesklinischer Behandlung von Bedeutung sind.

Methodik: Es wurden 567 konsekutiv behandelte Patienten aus 10 psychosomatischen Kliniken (stationäres und tagesklinisches Setting) eingeschlossen und ihre Beeinträchtigung zu Beginn und zum Ende der Therapie erfasst (Symptom-Check-Liste-90-R, Global Assessment of Functioning). Vor Aufnahme wurde mit Hilfe eines Ratingbogens zu Indikationsaspekten (RSIC) die Ausprägung von Variablen beurteilt, welche für eine Indikationsstellung von Relevanz sein könnten. Über eine Regressionsanalyse wurden Beziehungen zwischen diesen Variablen (Prädiktoren) und dem Therapieergebnis in beiden Settings untersucht.

Ergebnisse: Stationär und tagesklinisch behandelte Patientengruppen unterschieden sich schon zum Aufnahmezeitpunkt in Hinblick auf einen Teil der untersuchten Variablen. Diese geben Hinweise auf Kriterien, welche Kliniker für eine Zuweisung heranzogen. Ein gutes Therapieergebnis in den Tageskliniken war mit einer höheren Motivation der Patienten und einer ausgeprägteren Belastung in deren Alltagssituation assoziiert, ein schlechteres Ergebnis mit einem geringeren Antrieb.

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Stationäre Patienten profitierten weniger, wenn ihre Symptome durch Auslöser im Alltag getriggert wurden und sie ein ausgeprägtes Regressionspotential aufwiesen.

Fazit: Die Ergebnisse der Studie geben erste Hinweise auf Kriterien, welche für eine differentielle Indikationsstellung zwischen stationärer und tagesklinischer psychosomatischer Behandlung Relevanz haben.

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Introduction

In Germany there is an increasing interest in day hospital programs as alternative to acute inpatient treatment in psychiatry as well as in psychosomatic medicine [1], [2], [3], [4], reflecting an international trend [5]. The reasons are primarily economical in nature, but also due to the specific advantages and disadvantages of each treatment setting.

Previous studies showed that not only inpatient units but also day hospitals can treat patients with severe mental disturbances [1], [4], [5], [6]. This is true for day hospitals which are designed for intense and acute care. As there is a broad variety of profiles and structures among partial hospitalization programs [7], “day hospitals” (as an alternative to full-time hospitalization) have to be differentiated from “day care centres” for rehabilitation purposes (treating the chronically ill), “day treatment programs”, which are designed to intensify outpatient care and “transitional day clinic programs”, which build a link between inpatient and outpatient treatment [2], [7], [8]. Two systematic reviews compared effectiveness of inpatient and day hospital treatment in psychiatry [5], [6], showing that on average both settings are equally effective for a patient group which seems suitable for both treatment settings (approximately 21% to 39% of patients [5]). The most frequent exclusion criteria for day hospital treatments are dangerousness to self or others, severe cognitive impairment or antisocial behaviour.

However, reviews and meta-analyses report on overall effectiveness and do not differentiate between subgroups of patients that might profit more or less in one or the other setting. They can not give an answer to the question as to which characteristics of a single patient are of relevance for making a decision between inpatient and day clinic treatment.

Advantages and disadvantages of inpatient and day hospital treatment

Inpatient and day hospital programs for acute care have many similarities. Usually they are highly structured and provide multimodal treatment programs (pharmacotherapy, psychotherapy, somatic management, social work). Patients are treated in a group context, which is more or less explicitly used for therapeutic purposes (“therapeutic milieu”). But in order to approach the question of differential indication, it is necessary – besides these similarities – to clarify the differences and specifics of each setting including their therapeutic impacts.

Inpatient treatment has the advantage of a given daily structure (24 hours, 7 days a week) and continuous supervision by professional staff. It allows distancing from a situation at home or at work that might be strenuous and pathogenic. Disadvantages could be secondary gains: the hospital as the better place compared to the situation at home, with less demands and more help. Furthermore, problems of the everyday context are far away and become less emotionally relevant. This may lead to difficulties after discharge and a higher possibility for relapse. The specific offer of day clinic treatment lies in a combination of an intense, multimodal treatment and continuous contact to the situation at home. Cameron already stated in 1947 after opening the first psychiatric day hospital in Canada ([9], p. 62): “our work rendered more vital, the issues have been made more living and pressing by reason of the fact that the patient remains in daily, in realistic relation with the problems of his home and his general social setting. This new design has enabled us to obviate the ‘escape into hospital’”. Patients report daily on problems with their family and social context. These problems can be worked on with direct emotional involve-

ment. On the other hand, treatment in a day hospital is strenuous and relatives often do not release patients from daily tasks. Patients might be overtaxed and not able to really “digest” the therapeutic input.

Treating mental disorders in Germany: a special situation

Differences in health care systems of countries have to be described to fully understand the context of research results. For this study, it is important to know that in Germany two medical specialities for treating mental illnesses have developed during the last century: psychiatry and psychosomatic medicine [10]. While in psychiatry, biomedical and pharmacological approaches gained in importance after the second world war, psychosomatics – which has its roots in psychiatry as well as in internal medicine – was strongly influenced by psychoanalytic thinking, anthropological medicine and concepts of the “therapeutic community” [10], [11], [12].

Today, both medical specialities still exist and have become more specialized. Like psychiatry, psychosomatic medicine has developed into a modern discipline, combining psychotherapeutic (psychodynamic, cognitive-behavioural and systemic), somatic as well as pharmacological treatment strategies [11], [12]. Its focus is still on psychotherapeutic treatment with the unique situation of more than 2600 inpatient beds in Germany for acute care, which can provide intense psychosomatic-psychotherapeutic programs – and even more beds for rehabilitation purposes [3]. An increasing number of clinics for acute care provide additional units with a day clinic program.

There are similarities between psychiatric and psychosomatic units when looking at the minority of programs in psychiatry that have a primarily psychotherapeutic orientation (for example: about 37% of psychiatric day hospitals in Germany have such a focus; [2]). Besides an overlap in some patient groups (depression, personality disorders, anxiety disorders), there are considerable differences in the diagnostic spectrum treated: Eating disorders, somatoform disorders and patients with adjustment disorders and co-morbid somatic illness are primarily treated in psychosomatic departments [1], while patients with psychoses, severe depression, organic brain disease, dementia or substance abuse disorders are typically seen in psychiatry [10].

The aim of this exploratory and naturalistic study was to identify criteria which could help clinicians decide whether day hospital or inpatient treatment is preferable for a single patient. Our research question was: What are the aspects (predictors) associated with a good or bad outcome in inpatient or day hospital treatment?

We assumed that criteria of relevance will be due to the special advantages and limitations of each setting.

As this was not a randomized study, we additionally compared patient groups according to a range of variables that might have been relevant for therapists when decid-

ing if a patient should be treated in an inpatient or day clinic setting.

Subjects and methods

A prospective study was conducted. Permission was obtained from the local ethics committees. The outline was described in another publication [1], so an abbreviated version is presented here. We aimed to include between 250 and 300 cases for each treatment setting, with a minimum of 30 cases in each centre. The study started in November 2006 and ended for each centre when the projected number was reached. We excluded admissions for diagnostic purposes, crisis interventions with a stay of less than three weeks and patients for whom a change between settings was planned (“step-down” or “step-up” approach), as we wanted to compare psychosomatic-psychotherapeutic treatments of a sufficient length and compare both settings (excluding combined treatments (day hospital + inpatient stay) at this point). All patients gave their informed consent.

Treatments

The treatment centers were all hospitals for Psychosomatic Medicine with an intense multimodal treatment approach. The main interventions are psychotherapeutic in nature, but psychotropic medication was given additionally when needed. Interventions comprise individual and group sessions, art, music and body therapy, relaxation therapy, sessions with the nursing staff, physician rounds (medication and treatment of somatic problems), symptom oriented and educational groups, family sessions and sessions with a social worker. Nearly all of the centers combine psychodynamic, cognitive-behavioral and systemic components. The “dose” of intervention was similar in all centers with about 22–23 hours of interventions per week (range: 18 to 30 hours; including planned appointments with the nursing staff like ward rounds and morning meetings in the day clinic). The mean treatment duration was 9–10 weeks (inpatient: $M=8.7$, $SD=4.4$, day hospital: $M=9.9$, $SD=4.1$; [1]).

Instruments

Patients were assessed when starting treatment and at time of discharge using self-report instruments as well as expert ratings to measure initial impairment and improvement over the course of therapy. At admission, trained therapists rated overall impairment using the “Global Assessment of Functioning” (GAF). Patients were administered questionnaires containing the SCL-90-R (general psychic disturbance), the IIP-C (severity of interpersonal problems) and the SAS-R (social adjustment). At the end of treatment, therapists again rated GAF scores and documented the diagnoses of the treatment episode (main and secondary diagnoses). Furthermore, they documented premature endings of treatment. Patients

were administered the SCL-90-R again at the end of therapy.

Before admission, experts who did the first assessment of patients in the outpatient clinics filled out a "Rating Scale of Indication Criteria" (RSIC), which was developed in the research group.

The *Symptom-Check-List "SCL-90-R"* [13], [14] is a 90-item self-report measure of symptom severity. The German version has been well validated on a large heterogeneous sample and has shown acceptable reliability as a general measure of distress [15], [16].

The *Global Assessment of Functioning "GAF"* is a quick and simple measure of overall psychological disturbance. It contains an expert rating of social, occupational and psychological functioning in adults and uses a numeric scale (0 through 100). It showed sufficient reliability and validity also in raters having only one brief training session [17], [18].

The *Inventory of Interpersonal Problems "IIP-C"* [19], [20] is a 64-item self-report questionnaire assessing interpersonal difficulties and sources of distress. The measure comprises 8 subscales. It has demonstrated good correspondence with other self-report and interview-based instruments for assessing personality characteristics [21]. The German version of the IIP-64 has achieved good validity and reliability [22].

The *Social Adjustment Scale SAS-R* [23], [24] is a 54-item self-report instrument investigating 6 social role areas. These areas are work, social and leisure activities, relationships with family and friends, and role as marital partner, parent or within the family unit. The total score indicates overall social adjustment and functioning.

The *Rating Scale of Indication criteria (RSIC)* [1] is based on a list of aspects of potential relevance for differential indication between inpatient and day hospital treatment. The list comprises 43 items and was developed using a nationwide survey on indication [3] as well as expert discussions in semiannual meetings of the "Work group of Psychosomatic and Psychotherapeutic Day Hospitals". A manual was developed and a practicability study conducted to assure the correct usage and reliability of the instrument. The main areas covered by the instrument are shown in Table 1 (see also [1]). For the search of predictors, we included all interval scaled items of the RSIC (coded from "0"="not at all" to "3"="strong") and skipped the items which were descriptive (example: way to the clinic by car, bus etc.) or used "yes"/"no" decisions (example: previous hospitalization).

Outcome criteria

The primary outcome was a change in the Global Severity Index (GSI) of the SCL-90-R (admission → discharge). We chose this measure since the SCL-90-R is one of the most used instruments to measure general psychic disturbance and its change over time. There are validated criteria for clinically significant change and large patient as well as population based samples for comparison [25]. We decided on a pre-post measurement as a pilot study on 114

patients showed high correlations between the results at discharge (post) and a 3-month follow-up ($r=0.79$ for inpatient treatment and $r=0.87$ for day hospital treatment). As secondary outcome criterion we used changes on the GAF-score to validate findings by an additional measure and expert rating of outcome.

Power calculation

From previous analyses of samples on day hospital and inpatient treatment [26], statistical parameters of change on the SCL-90-R were known. To identify a difference of 0.2 GSI points (Cohen's $d=0.33$) between two groups for $\alpha=0.05$ and $1-\beta=0.8$ the sample size was determined to be $N=145$. Organizing the project, patient recruiting was much easier than expected. In order to increase the statistical power of the explorative analyses it was decided to exceed the planned sample size and to include $N=250$ patients in each setting.

Data analyses

The statistical analyses were performed with SAS-JMP V6. Exploratory and descriptive data analyses are used (means, standard deviations). Differences between the settings are tested with t-test for independent samples and cross-tabulations according to scaling level. Because of the large sample size, a level of significance of 0.01 is used. Hierarchical regression analysis is used to identify predictors of outcome. The difference between admission and discharge of the outcome criterion is the dependent variable. The basic model (difference = int + Severity_at_admission + error) controls for symptom severity at admission, taking into account the well known dependency of difference scores on starting values, attributable to effects of regression to the mean. All indication criteria from the RSIC are added to the models in a second step of the hierarchical regressions. The selection of the predictors of the second step were selected with stepwise regression models. The gain of variance explained by the additional and significant predictors is reported.

Results

Patients and treatment outcome

567 consecutive treatment episodes could be included in the study: 299 inpatients and 268 day hospital patients. Mean age was 40.1 years ($SD=14.3$) with no difference between settings (inpatients: 41.0; $SD=15.1$; day hospital: 39.2, $SD=13.5$). 74.4% of the patients were female, again with no difference between settings [1]. Mean duration of treatment comprised 9.2 weeks ($SD=4.3$), with a slightly longer duration in day hospital treatment (9.9, $SD=4.1$ vs. 8.7; $SD=4.4$). The main diagnoses (with most of the patients showing co-morbidity on axis I and II; DSM IV) were depression (39.9%), eating disorders

Table 1: Rating scale of indication criteria

Area	Items
1. way to the clinic	<ul style="list-style-type: none"> - distance home ↔ clinic - travel time - means of transport - ability to cope with the way to the clinic <ul style="list-style-type: none"> ○ in relation to psychic impairment ○ in relation to physical impairment
2. need of assistance for other family members	<ul style="list-style-type: none"> - Are other people or pets to be cared for? (children, parents, others) - Other reasons that make it necessary to be present at home?
3. burdens at home	<ul style="list-style-type: none"> - How high is the level of burdens at home? - necessity of easing (perspective of patient/perspective of therapist)
4. daily structure	<ul style="list-style-type: none"> - How much help is necessary to structure the day?
5. social isolation	<ul style="list-style-type: none"> - How socially isolated is the patient?
6. loss of interest/drive	<ul style="list-style-type: none"> - Is there a loss of interest and drive (magnitude)?
7. physical/somatic problems	<ul style="list-style-type: none"> - Does the patient have to be monitored because of somatic problems?
8. characteristics of symptoms	<ul style="list-style-type: none"> - Are symptoms triggered by situations at home (to what extent)?
9. practice at home	<ul style="list-style-type: none"> - Is it necessary to transfer changes to the situation at home in a timely manner?
10. chronicity	<ul style="list-style-type: none"> - For how long do the symptoms exist (months, years)?
11. exhaustion	<ul style="list-style-type: none"> - Is the patient exhausted (magnitude)?
12. self regulation capacities	<ul style="list-style-type: none"> - Is there suicidal ideation (intensity)? - Are there self-destructive behaviours (intensity, magnitude)? - How good is the patient's ability to regulate impulses in crisis situations? - Is there substance misuse / dependency (intensity)
13. previous treatments	<ul style="list-style-type: none"> - inpatient (how often, for how long; experienced as helpful?) - day clinic (how often, for how long; experienced as helpful?) - Was there an increase in symptoms directly after discharge from the clinic?
14a. family	<ul style="list-style-type: none"> - Are there serious problems in the family (violence, conflicts, entanglement etc)? - Is distancing indicated?
14b. social context	<ul style="list-style-type: none"> - Are there serious problems in social relationships (conflicts, violence, entanglement etc.)? - Is distancing indicated?
15. psychological mindedness	<ul style="list-style-type: none"> - level of insight and reflective abilities
16. regression potential	<ul style="list-style-type: none"> - Do reports of the patient point to strong wishes to be cared for, give up responsibility or the negation of such (problems with separation, emphasis on autonomy etc.)?
17. motivation	<ul style="list-style-type: none"> - level of motivation for inpatient or day clinic treatment

Grey = items which were not included in the regression analysis (descriptive items or items with "yes/no"-answers); item 15 was not included as it is highly correlated with item 17.

Table 2: Symptom severity at admission and discharge

instrument	time point of measurement	total sample n=567	inpatients n=299	day hospital n=268	ANOVA _r WKW t test
SCL-90R-GSI	Pre Post missings	1.35 (0.66) 0.91 (0.66) 73/567	1.38 (0.64) 0.86 (0.62) 48/299	1.32 (0.91) 0.96 (0.70) 25/268	Trt: n.s. Time: F=269.9; df=1,495; p<0.0001 Time x Trt: F=7.1; df=1,495; p<0.008
GAF	Pre Post missings	50.3 (11.5) 64.0 (12.4) 17/567	49.8 (12.4) 65.9 (12.9) 12/299	50.9 (10.3) 62.0 (11.5) 5/268	Trt: n.s. Time: F=663,0 df=1,549, p<0.0001 Time x Trt: F=21.7; df=1,549, p<0.0001
IIP-C total score	Pre missings	0.30 (0.80) 99/567	0.33 (0.78) 46/299	0.27 (0.82) 53/268	Trt: t-test & WKW n.s.
SAS total score	Pre missings	2.46 (0.56) 35/567	2.44 (0.54) 23/299	2.48 (0.60) 12/268	Trt: t-test & WKW n.s.

Pre = admission; Post = discharge; Trt: testing for differences between settings;

Time: testing for changes pre → post; Time x Trt: testing for differences between settings in changes over time; ANOVA_r = ANOVA for repeated measurement; WKW=Wilcoxon-Wallis-rang sum test or t-test

Effect Sizes at Post: $ES = (M_{\text{inpt}} - M_{\text{dayclin}})/SD_{\text{pooled}}$; $ES_{\text{SCL}}=0.15$; $ES_{\text{GAF}}= 0.32$

(11.8%), anxiety disorders (11.3%), somatoform disorders (10.2%), personality disorders (9.7%) and adjustment disorders (9.2%) (most of these patients having an additional somatic illness) [1]. There were no significant differences in severity of patient's impairment between settings at time point of admission (SCL-90-R, GAF, IIP-total-Score, SAS-total score; see Table 2).

Concerning differences in outcome, we found somewhat higher improvement rates after inpatient treatment (GAF, SCL-90, see [1] and Table 2). However, it has to be taken into account that effects will easily become significant with the large number of cases included.

Comparing inpatients and day clinic patients at time point of admission

In contrast to overall symptom severity and sociodemographic data, we found some significant differences between samples at admission on the RSIC, pointing to aspects which were used by clinicians for decision making (see Table 3): Inpatients showed more problems (somatic or psychic) making it difficult to manage the way to the clinic. They had more somatic problems, were more exhausted initially and had a higher level of problems in the social context (relations to others outside the family). Day clinic patients more often showed symptoms which were triggered by situations at home and therapists therefore saw a higher need for "applying therapy at home". Compared to inpatients, day clinic patients had a higher motivation for psychotherapy as well as better self regulation capacities.

There were no differences between samples concerning the need for daily structure, the level of burdens at home, the amount of social isolation and loss of interest or drive, family problems or regression potential as assessed by experienced clinicians.

Primary outcome

The basic model of the hierarchical regression shows a significant relation of GSI scores at admission with change for both the inpatient treatment ($R^2=0.26$) and the day clinic treatment ($R^2=0.16$).

Inpatient treatment (primary outcome)

In the second step of the regression analyses two items of the RSIC predicted change: Patients who had symptoms triggered by situations at home were less successful ($p<0.028$), as well as patients with a high potential for regression ($p<0.04$; Table 4). Paradoxically, the model including both predictors explained less of variance ($\Delta R^2=-0.019$) compared to the GSI at admission alone.

Day hospital treatment (primary outcome)

Two items of the RSIC predicted GSI-change: Patients with a high motivation for psychotherapy were more successful ($p<0.0001$), as well as patients who reported a high burden with daily tasks at home ($p<0.031$), see Table 4. The gain in variance explained was $\Delta R^2=0.12$, raising the total variance explained from $R^2=0.16$ to $R^2=0.28$.

Table 3: Inpatients and day clinic patients: samples differences in indication criteria

Variable	inpatients m(SD)	day clinic m(SD)	Mann-Whitney-U-Test
1d ability to cope with the way to the clinic (psychic impairment)#	0.63 (0.04)	0.19 (0.04)	p<.0001
1e ability to cope with the way to the clinic (physical impairment)#	1.17 (0.52)	0.52 (0.63)	p<.0001
3. burdens at home	1.27 (0.93)	1.12 (0.87)	p<0.04.
4. need for daily structure	1.18 (0.87)	1.10 (0.85)	n.s.
5. social isolation	1.18 (0.05)	1.21 (0.51)	n.s.
6. loss of interest/drive	1.40 (0.04)	1.34 (0.05)	n.s.
7. physical/somatic problems	1.06 (0.84)	0.67 (0.59)	p<.0001
8. characteristics of symptoms (trigger)	1.27 (0.05)	2.15 (0.73)	p<.0001
9. practice at home	1.34 (1.08)	2.15 (0.73)	p<.0001
10. chronicity	1.60 (1.08)	1.67 (1.02)	n.s.
11. exhaustion	1.79 (0.85)	1.48 (0.81)	p<.0001
12. self regulation capacities: problems with....			
a. suicidality	0.68 (0.68)	0.48 (0.52)	p<.0015
b. auto-destructive behaviour	0.62 (0.76)	0.42 (0.70)	p<.0006
c. impulse regulation	1.44 (0.70)	1.72 (0.64)	p<.0001
d substance misuse	0.54 (0.81)	0.34 (0.61)	p<.0052
14a. family problems	1.54 (0.06)	1.44 (0.06)	n.s.
14b. social context (problems)	1.42 (1.00)	1.13 (0.91)	p<.0007
16. regression potential	1.49 (0.88)	1.51 (0.80)	n.s.
17. motivation	1.72 (0.73)	1.93 (0.67)	p<.0002

: higher values = higher impairment

Secondary outcome

The basic model of the hierarchical regression shows a significant relation of GAF scores at admission with change for both the inpatient treatment ($R^2=0.29$) and the day clinic treatment ($R^2=0.14$).

Inpatient treatment (secondary outcome)

Two variables were identified as significant predictors: Social isolation ($p<0.042$) and a higher potential for regression ($p<0.018$) showed a correlation with less favourable changes in the GAF score (see Table 4). The gain in variance explained was $\Delta R^2=0.05$, raising the total variance explained from $R^2=0.29$ to $R^2=0.34$.

Day hospital treatment (secondary outcome)

Positive changes in the GAF could be predicted by a higher motivation ($p<0.0001$). A less favourable outcome

was associated with social isolation ($p<0.02$) and a loss of interest/reduced drive ($p<0.01$), see Table 4. The gain in variance explained was $\Delta R^2=0.09$, raising the total variance explained from $R^2=0.14$ to $R^2=0.22$.

Prediction of outcome by pre-treatment patient characteristics

As pre-treatment patient variables are described as important variables to explain outcome variance [27], we examined if age, gender, social adjustment (SAS total score) or interpersonal problems (IIP total score) were predictive of outcome in each setting.

None of these variables predicted outcome (changes in GSI, GAF), neither in the day clinic nor in the inpatient setting.

Table 4: Prediction of treatment outcome (pre → post)**4. a. Basic regression model**Model: Δ Variable = Variable at Admission + error

Setting	Dependent Variable	Statistics				
		R ²	F	df (err)	beta	p
inpatient	ΔGSI	0.259	87.8	1(251)	-0.46	<0.0001
	ΔGAF	0.291	117.0	1(285)	-0.61	<0.0001
day clinic	ΔGSI	0.157	44.9	1(242)	-0.35	<0.0001
	ΔGAF	0.137	41.4	1(230)	-0.36	<0.0001

4.b. Significant additional predictors

Extended models

 Δ Variable = int + Variable at Intake + [additional predictor]₁ + ... + [additional predictor]_n + error

Setting	Dependent Variable	Significant additional predictors	Beta	t ratio	p<	F; df1, df2	R ²	gain in R ²
inpatient	ΔGSI	8 triggers at home 16 regression potential	0.08 0.09	3.35 2.66	0.0276 0.0404	36.8; 3,244	0.240	-0.019
	ΔGAF	5 social isolation 16 regression potential	-1.96 -2.24	-1.97 -2.36	0.0417 0.0182	36.9; 3,220	0.336	+0.045
day clinic	ΔGSI	3 burdens at home 17 motivation	-0.10 -0.25	-2.37 -4.27	0.0309 0.0001	22.9; 3,235	0.277	+0.120
	ΔGAF	5 social isolation 6 drive/loss of interest 17 motivation	-2.14 -2.40 3.99	-5.29 -2.50 4.12	0.0171 0.0098 0.0001	14.5; 4,200	0.224	+0.087

Discussion

The study aimed to identify variables which predict outcome in patients being treated in psychosomatic inpatient and day clinic settings in Germany. Before discussing the results, the main limitations of the study should be noted. As patients were not randomized, clinicians already made decisions as to which patient should be treated in which setting. Assuming that clinicians on average do a good job with correct and therefore positive indications, we had to expect a positive selection bias for both settings. This limits the range in ratings of some items of the RSIC and therefore reduces predictive power. Furthermore, we included a broad range of patients with different diagnoses and ten different clinics. The outcome measures chosen, the Global Severity Index (GSI) and the GAF will capture overall disturbance (more like measuring temperature in the case of fever), but are not very specific. This makes sense in a search for more global predictors, but it will miss specific problems of some disorders. Furthermore, changes in the GSI and the GAF scores will not be associated with exactly the same predictors, as the GAF rating is not only related to overall symptom severity but to social impairment as well. A further limitation is that GAF-ratings were conducted by trained clinicians and not external (blinded) experts. Finally, it has to be mentioned that pre-treatment variables may show only moderate relations to outcome, as the treatment process and

interventions of course will be adapted to the special problems of a single patient [28].

The strength of the study is the large sample size and the overall similarity of treatment intensity ("dose": therapy sessions per week) and structure when comparing inpatient and day clinic programmes [1]. As we used a multi-centre approach, we can assume that patients are representative of patients that are treated in psychosomatic clinics in Germany. In summary, we assumed that if we can identify predictors of outcome at all, they will be valid and point to indication criteria related to the advantages and disadvantages of either setting. Differences in initial characteristics of patients will give additional hints to possibly relevant aspects for differential indication as they are used by experienced clinicians.

In terms of data analysis, we had to take into account that the pre-treatment value of outcome measures is a strong predictor of change and has to be controlled for. The question had to be: How much variance is accounted for by additional predictors?

Concerning predictors of change (GSI) in the day clinic setting, we found positive correlations with two variables of the RSIC: Patients with a high motivation for treatment did better, as well as patients who reported high burdens at home before admission, adding 11% to the explanation of variance. Both predictors clinically make sense. In a day clinic setting, patients have to decide to make the way to the clinic every day. Treatment will only bear fruit if patients comply and get intensely involved, although

daily tasks are waiting at home and sometimes make it strenuous to come to the clinic. For patients who report on many burdens at home, there might be a need to work on those burdens directly (reduce them or change attitudes towards them). An inpatient setting allows distancing and may lead to some relief in the beginning, but inducing change could be more difficult without the connection to the situation at home. In summary, patients who show high burdens at home can effectively be treated as day clinic patients if there is a high motivation for treatment and change.

Concerning outcome in the inpatient setting, we found only variables correlated with a less favourable course: If treatment was associated with secondary gains (regression potential, defined as strong wishes to be cared for and give up responsibility), and if symptoms are triggered by situations at home, patients did less well. Again, criteria are clinically meaningful. Clinical examples for “triggers at home” are bulimia nervosa or phobic disorders, in which symptoms may disappear while patients are in the secure place of a clinic, but reappear before admission or after discharge. Exposition should be a focus of such treatments and is more easily done in a day clinic setting where patients have a daily confrontation with the situation at home. A high potential for regression may lead to a process where changes in symptoms become associated with the feared discharge and the loss of the secure place in the clinic, causing stagnation of improvement. But interpretation of these findings must be cautious as the relations are “weak”. The regression model did not lead to a real gain in variance explained. The causes of this effect could not be identified, perhaps it is due to a correlation of predictors and the symptom level (GSI) at admission. It is open to further investigation, whether the predictors found here are only aspects of symptom severity at admission or whether they really moderate or mediate treatment effects.

The variables associated with a reduction of GAF-scores (secondary outcome) partly support the findings described above and partly add new aspects. Related to outcome in the day clinic setting, we identified three variables. Primarily, motivation was an important predictor, supporting the findings related to changes on the GSI. Furthermore, patients with impaired drive or loss of interest did less well. This means that sufficient motivation and drive is a necessary base for a successful day treatment. Severely disturbed patients with insufficient motivation and drive should at least initially be treated as inpatients. A high regression potential was again found as predictive for a less favourable course in inpatients, validating the finding in predicting GSI-changes.

Social isolation seems to be a negative predictor in both settings. Patients who are socially isolated might have difficulties with others and the tendency to withdraw, feeling uneasy in the group context on a ward or a day clinic. Probably, this patient group is a difficult to treat group in general. The finding does not mean that an intense setting is not indicated.

Due to the 1st-level-model, the statistical analysis is limited to interval scaled predictors: Ordinal scaled ratings were included and nominal variables had to be excluded. Together with the previously mentioned problems with a reduction explained variance in one model, and the fact that predictors identified with stepwise procedures tend to be sample specific, the results of the hierarchical regression analysis must be interpreted with caution.

As expected, there was a selection of patients in each setting. In patients who were in a clear need for monitoring and a holding environment (exhausted patients, patients with somatic illness and lower impulse regulation capacities) and in patients who had problems to manage the way to the clinic on a daily basis, clinicians preferred inpatient treatment. This was also true for patients with more severe problems in social relationships – therapists might have seen distancing as necessary. Patients were more often sent to day treatment if the daily return home was assumed to have a therapeutic value. If there was a close link between situations at home and symptoms, a “training situation” and daily “exposition” was seen as helpful and even necessary for improvement and maintenance of gains [29]. Clinicians therefore already used a criterion we found in our predictor analysis to be related to a good outcome in day treatment (see above). They also recommended day treatment for patients with higher motivation more often (another aspect we found related with good outcome), as well as for patients with better impulse regulation capacities.

In summary, we found a general predictor like social isolation describing an impaired group of patients having difficulties to improve independently of the treatment setting. Furthermore, we identified aspects which seem to be a precondition for one setting, like a sufficient motivation and drive for the utilization of a day clinic program. Additionally, there are aspects that speak against one setting: too many secondary gains (regression potential) might be counterproductive for inpatient treatment. It's important to note that interpersonal problems, severe family problems or chronicity in this study do not differentiate between successful and less successful treatments in either setting.

A next step in further studies should be to test for more specific hypotheses based on these exploratory results and to evaluate generalizability in other health care systems.

Notes

Conflicts of interest

None declared.

Acknowledgements

Many thanks to the “Heidehofstiftung” for supporting the project. Further thanks to all patients and team members who contributed and made this study possible.

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Please cite as

Zeeck A, von Wietersheim J, Hartmann A, Einsele S, Weiss H, Sammet I,
Gaus E, Semm E, Harms D, Eisenberg A, Rahm R, Küchenhoff J.
Inpatient or day clinic treatment? Results of a multi-site-study. *GMS
Psychosoc Med.* 2009;6:Doc03.

This article is freely available from

<http://www.egms.de/en/journals/psm/2009-6/psm000059.shtml>

Published: 2009-10-13

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