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## Evaluation of inpatient Dialectical-Behavioral Therapy for Borderline Personality Disorder — a prospective study

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### Abstract

Dialectical-Behavioral Therapy for Borderline Personality Disorder (DBT) developed by M. Linehan is specifically designed for the outpatient treatment of chronically suicidal patients with borderline personality disorder. Research on DBT therapy, its course and its results has focused to date on treatments in an outpatient setting.

Hypothesizing that the course of therapy could be accelerated and improved by an inpatient setting at the beginning of outpatient DBT, we developed a treatment program of inpatient therapy for this patient group according to the guidelines of DBT. It consists of a three-month inpatient treatment prior to long-term outpatient therapy. In this pilot study 24 female patients were compared at admission to the hospital, and at one month after discharge with respect to psychopathology and frequency of self-injuries. Significant improvements in ratings of depression, dissociation, anxiety and global stress were found. A highly significant decrease in the number of parasuicidal acts was also reported. Analysis of the average effect sizes shows a strong effect which prompts the development of a randomized controlled design. © 2000 Elsevier Science Ltd. All rights reserved.

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### 1. Introduction

DBT is a cognitive-behavioral therapy, developed by M. Linehan originally for the outpatient treatment of chronically suicidal patients with borderline personality disorder. As

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with standard behavior therapies, DBT presumes that attention to both skills acquisition and behavioral motivation is essential for change. Taking into account the characteristic features of patients with borderline personality disorder, several modifications to standard behavioral therapy were made (Linehan, 1993). First, a number of treatment strategies that reflect acceptance and validation of the patients' current capacities and behavioral functioning were gathered and added to the treatment. The dialectical emphasis of the treatment ensures the balance of acceptance and change within the treatment as a whole and within each individual interaction. Second, treatment of the patient was split into three components: one that focuses primarily on skill acquisition, one that focuses primarily on motivational issues and skills strengthening, and one designed explicitly to foster generalization of skills to everyday life outside the treatment context. Third, a consultation-team-meeting with specific guidelines for keeping the therapist within the treatment frame was added. In standard outpatient DBT, treatment consists of structured psychosocial individual or group therapy (for skills training), individual psychotherapy (addressing motivational and skills strengthening), telephone contact with the individual therapist (addressing generalization), and peer supervision meetings (to monitor the therapist). DBT is further characterized by a clear hierarchy of treatment targets (the behavior identified for change), and a set of treatment strategy groups (tactics and procedures of the therapist used to achieve change). In contrast to many behavioral approaches, DBT also places great emphasis on the therapeutic relationship.

Reliable data are available for an outpatient treatment period of one year. During this period and in the framework of a controlled randomized study, DBT proved to be superior with regard to several factors compared to experienced therapists following an unspecified 'treatment as usual' approach. Frequency and severity of parasuicidal acts were significantly reduced in the group of patients treated according to DBT; the same is true for the frequency of premature treatment termination, as well as for the frequency and length of stays in psychiatric hospitals (Linehan, Armstrong, Suarez, Allmon & Heard, 1991; Linehan, Heard & Armstrong, 1993). Meanwhile, data from replication studies are available (Koons, 1998).

As discussed above, DBT was originally developed as a form of outpatient therapy and emphasizes the potential risk of nonspecific inpatient treatment. One of the main risk factors seems to be the (unintended) reinforcement of dysfunctional patterns of behavior such as self-injury, suicide attempts, and/or suicide communications by the therapeutic milieu. This notion is similar to the views of numerous depth psychology-oriented authors who particularly emphasize the distinct tendency towards 'regression' on the part of borderline inpatients, as well as 'manipulatory behavior' and difficult transference and counter-transference phenomena. A deterioration of the symptoms and a tendency towards long-term hospitalization are the most frequent results (Nurnberg & Suh, 1978; Rosenbluth & Silver, 1992).

Nonetheless, several reasons speak for the development of a specific module of inpatient treatment according to the guidelines of DBT. First, the number of patients who meet the criteria for borderline personality disorder is estimated at 30% of all inpatients worldwide who are treated for personality disorders, thus ranking in first place (Loranger et al., 1994). Second, the probability of requiring psychiatric or psychosomatic inpatient treatment at some point in one's lifetime is unusually great for persons with a borderline disorder. We studied a representative population of 40 female patients in Germany with borderline

personality disorder according to DSM-IV and DIB-R (Gunderson, Kolb & Austin, 1981) and discovered this to be the case for 84% of these patients. Following initial hospitalization, 80% of them returned annually for an average annual inpatient stay of 70 days (Jerschke, Meixner, Richter & Bohus, 1998). On the basis of these findings, inpatient stays seem to increase the probability of readmission or at least they do not contribute substantially to outpatient stabilization. A third argument does not rely on data but on the clinical experience that in an unstructured inpatient setting both therapists as well as other caregivers are often unable to cope with borderline patients and that the nonprofessional handling of parasuicidality or states of dissociation often contributes to an aggravation of the dysfunctional behaviors. This frequently demands a high level of energy and time in conjunction with team meetings, consultations or supervision — to the disadvantage of other patients. And finally, despite the empirical superiority of DBT to nonspecific types of treatment, its therapy results are not optimal. Vital psychopathological parameters such as depression and anxiety, for example, were still high at the end of one year of treatment. It should be possible then to harness the synergy potential of a multidisciplinary team of inpatient therapists so as to increase the efficacy of DBT.

In developing our concept we referred to the experiences at New York Hospital, White Plains, NY, where Ch. Swenson and S. Sanderson in collaboration with M. Linehan had developed an inpatient treatment program according to the guidelines of DBT. But it was Barley and colleagues who have meanwhile presented initial findings (Barley et al., 1993). They compared the average frequency of self-injuries and overdoses occurring monthly on the ward by borderline patients while receiving treatment according to one of two treatment conditions: a treatment approach based on depth psychology versus a treatment approach on the same ward during a subsequent time period following a restructuring of the ward concept according to DBT. With the introduction of DBT, parasuicidal acts decreased significantly. By comparison, on a general psychotherapy ward, where during the comparable time period therapy was not carried out along these guidelines, no changes occurred. K. Silk, who developed a short-term inpatient therapy module according to DBT, reported above all a high level of acceptance of the program on the part of caregivers, who felt more competent and better enabled to cope (Silk et al., 1994).

The basic concepts of treatment, as we have established them at the University Hospital for Psychiatry and Psychomatics in Freiburg, are described elsewhere (Bohus, Swenson, Sender, Kern & Berger, 1996). In summary, the three-month period of treatment can be divided into three stages. Diagnostics, including information as to the nature of the disorder according to DBT, as well as the treatment goals and strategies derived therefrom are clarified at the start.

The first stage of therapy covers approximately 3 weeks. An analysis of the targeted behavior, its antecedents and consequences takes place (at the highest possible resolution). The focus is particularly on the problem behavior responsible for the current hospitalization as an inpatient, as well on behavior that prevents any current outpatient treatment. Thereafter the therapy planning takes place together with the patient and the entire therapeutic team. Specifically oriented to the individual problem and the resources of the patient, members of the multiprofessional team develop the treatment targets that will guide the rest of the treatment, ordinarily the acquisition and strengthening of the patient's capacity to regulate tension as well

as emotion in the face of real psychosocial conflicts. The second stage of therapy encompasses the following goals:

1. Theoretical training of the patient targets the greatest possible understanding of the disorder. This implies both the acquisition of knowledge concerning the consequences of possible traumatization as well as the basics of emotion regulation, learning theory, and the effective mechanisms of psychotherapy (the patient should become a specialist in regard to her disorder).
2. Acquisition of specific skills for addressing those problems which led to hospital admission. E.g. stress tolerance, emotion modulation or development of self-management of dissociation or flashbacks.
3. Contingency management of reinforcers following self-injurious behavior or suicidal communication.

Focus of the third stage of therapy is discharge planning. This means not only the preparation for release from hospital but also the actual establishment of contact with the therapist responsible for continuing treatment, exposure to job stress or being alone. Support from social workers is important during this stage.

Approximately one year after beginning of restructuring the ward, the developmental phase was complete insofar as articulation of the basic treatment targets and the specific strategies and techniques to be used by members of the multiprofessional team were concerned. The treatment had been rated positive by both the therapeutic staff and the patients. At this point we do not have data addressing whether this inpatient module provided as a preparatory element prior to commencement of outpatient dialectic-behavior therapy actually has any positive effect on patient course and outcome. This can only be resolved within the framework of a controlled 'add-on design' (Bergin & Garfield, 1994). This would mean randomization into two groups, one starting immediately with outpatient DBT, while the other group starting first with inpatient therapy, followed by an outpatient therapy. In order to justify the expense of such a study, it is necessary to first test the feasibility, safety, and effect of the inpatient treatment module in question. We conducted a pre–post comparison of treatment outcomes to address these questions.

## 2. Methods

### 2.1. Sample

Subjects were 24 female patients treated in 1996 and 1997 as inpatients in accordance with the use of a DBT inpatient protocol and who met the following criteria:

- Borderline Personality Disorder diagnosed according to DIB-R (at least 8 points) and DSM-IV (at least 5 criteria).
- At least two parasuicide acts (i.e. with a consciously intended, resultant physical injury) and / or one suicide attempt within the past 2 years.

Patients who met any of the following diagnoses were excluded from the analysis:

- Schizophrenic disorders
- Bipolar I disorders
- Current (or within the past six months) alcohol and drug dependency.
- Suicide attempts or self-injurious behavior occurred only during depressive stages of a Major Depression or under the influence of alcohol or drugs.
- Mental retardation

Upon commencement of inpatient therapy patients were between 17.4- and 44.4-years of age (mean value = 28.3; S.D. = 7). The average number of stays in either psychiatric or psychosomatic hospitals prior to the current admission totaled 3.9, ranging from 0 (4 patients) to 16 hospital stays. The patients spent an average total of 94 days on the ward (S.D. = 26.0; min = 57 days, max = 177 days).

### 3. Research question

Is there a reduction of the number of parasuicidal acts, an improvement in emotion regulation and general indices of psychopathology between pretreatment and one month after release from hospital, that is four months after beginning inpatient therapy?

### 4. Instruments

A variety of instruments were used to survey the widest possible array of behavioral patterns. Whenever possible both self-rating as well as observer based rating procedures were employed:

- Lifetime Parasuicide Count, LPC: surveys the frequency of self-injuries within a given period,
- SCL-90-R: Symptom Checklist according to Derogatis, German version by G. Frank,
- Beck Depression Inventory, BDI,
- Hamilton Depression Scale, HAMD (21 Item-Version),
- State-Trait-Anxiety Inventory, STAI,
- Hamilton Anxiety Scale, HAMA
- Dissociative Experiences Scale, resp. Questionnaire on Dissociative Experiences, FDS,
- State-Trait-Anger Inventory, STAXI.

The measurements were made at onset of therapy (premeasurement) and 4 months thereafter (postmeasurement). The diagnosticians were not the therapists.

### 5. Statistical procedures

All evaluations were carried out using the 'Statistical Package for the Social Sciences, SPSS 6.13'. A test of normal distribution (K.-S. Lilliefors) was carried out to check the distribution of the frequency of self-injury. Comparisons of the mean values for dependent samples were

carried out for the variables at the interval level (FDS, BDI, STAI, SCL-90-R) in order to ascertain changes between the pre- and postvalues. Rank comparisons on the basis of the Wilcoxon Matched Pairs Signed Ranks Test were carried out for variables at the ordinal level (frequency of self-injury, STAXI, HAMA, HAMD).

## 6. Effect size

Effect size represents the standard measure of the extent of an effect of treatment, on the basis of which different studies can be directly compared. Effect sizes can be carried out for every measure surveyed in a study. In meta-analyses they are bundled into an integrated effect size which represents a quantitative equivalent of an effect of therapy (Grawe, Donati & Bernauer, 1994). Cohen (Cohen, 1988) suggested that the evaluation of the effect size can be divided into three parts. In the case of parametric procedures he recommends the sizes 0.20, 0.50, and 0.80 to label a slight, moderate or strong effect. There are no rules for determining the strengths of effect for procedures at the rank level. The current study resorts to a deviation  $p$  of 0.50 ( $p$  represents the percentage of the population that experienced improvement, 0.50 represents the random percentage) (Bortz & Lienert, 1998; Cohen, 1992). Here a deviation of 0.05 represents a slight, 0.15 a moderate and 0.25 a strong effect.

In this study then the effect sizes for the results were calculated and listed individually (Bortz & Döring, 1995; Bortz & Lienert, 1998; Cohen, 1992).

## 7. Antidepressive medication

19 of the 24 patients were free of any antidepressive medication at all points in the study (at admission, during the course of therapy and upon release from hospital). In four patients already receiving antidepressive medication at admission the type of medication and the dosage was continued. Since antidepressants were administered to one patient for the first time during the inpatient stay, rating of depressive symptoms for that subject were excluded from the evaluation in that case.

## 8. Results

The distribution of the frequencies of acts of self-injury can not be regarded as normally distributed; the K.-S. (Lilliefors) revealed a highly significant result ( $p < 0.001$ ), so that evaluations with regard to self-injuries must be carried out by means of nonparametric procedures.

### 8.1. Pre–post comparisons

A total of 19 tests of differences in the central tendencies were carried out (all 9 subscales

Table 1  
Results of t-tests for dependent samples. <sup>a</sup>

Variables	MV pre	MV post	Sig.	Effect size
Dissociation	24.9	14.6	0.002**	1.04
BDI	31.3	23.2	0.000**	1.30
STAI	72.9	68.5	0.025*	0.69
SCL-90-R				
Somatization	68.0	60.7	0.026*	1.14
Compulsiveness	75.3	64.2	0.000**	1.40
Social insecurity	77.0	67.8	0.003**	0.97
Depression	78.1	70.3	0.004**	0.91
Anxiety	73.6	65.0	0.001**	1.08
Aggression	70.7	64.5	0.020*	0.72
Phobic thoughts	71.9	63.6	0.002**	1.03
Paranoia	70.6	62.7	0.007**	0.82
Psychoticism	73.8	65.3	0.002**	1.02
Total stress	78.4	69.7	0.001**	1.08
Intensity	75.1	67.1	0.001**	1.13
Symptoms	75.0	65.0	0.002**	1.01

<sup>a</sup>  $p < 0.05^*$ ;  $p < 0.01^{**}$ .

and 3 total scores of the SCL-90-R were included in the evaluation, since it provides a good idea of the extent and the variability of the mental symptoms).

16 of these tests showed a significant difference, two tests indicated a tendency towards improvement and one test yielded a nonsignificant result. Results are listed in Tables 1 and 2.

All the tests carried out here yielded significant to highly significant improvements in the values, in most areas the t-values of the patients no longer fell within the extreme range, which is mirrored in the total scores of the SCL-90-R (Fig. 4). Data revealed a decrease in total stress as well as in intensity of the symptoms and the symptoms itself as subjectively assessed by the patients.

Self-ratings of dissociation, depression and anxiety also revealed significant improvement (Figs. 1, 2 and 3).

The effect sizes range from 0.69 to 1.40, the mean effect of therapy in regard to a reduction in the symptoms lies at 1.04 (including the complete scores of the SCL-90-R).

Table 2  
Results of the Wilcoxon tests<sup>a</sup>

Variables	Median pre	Median post	Sig.	Effect size
Frequency of self-injury	2.0	0.0	0.004**	0.25
STAXI	7	6	0.054	0.10
HAMA — Total Score	23	18	0.171	0.15
HAMD	17	12	0.055	0.17

<sup>a</sup>  $p < 0.05^*$ ;  $p < 0.01^{**}$ .

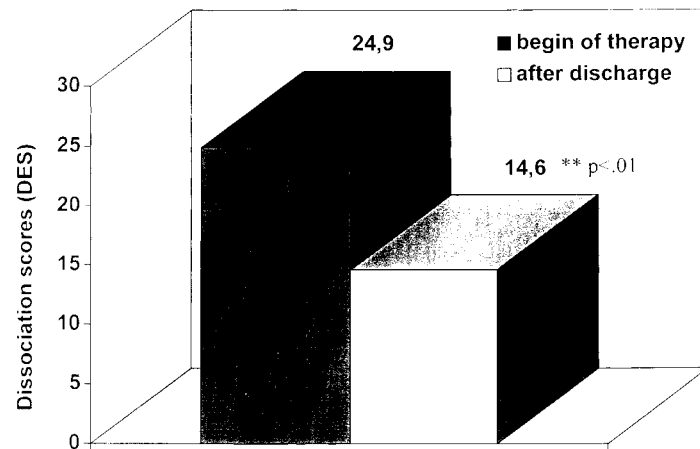


Fig. 1. Pre–Post comparison of the dissociation scores, DES ( $n = 24$ ); Premeasurement at the beginning of the therapy, postmeasurement after discharge (average inpatient treatment 3 months).

A significant decrease in the frequency of acts of self-injury during the period of the 4 weeks after discharge was discovered (Fig. 5).

The pre–post comparison (see Table 2), was carried out for all 24 patients, even though 6 patients did not report any act of self-injury for the presurvey period. The frequency for 11 of the 18 patients who initially reported self-injury dropped to 0, 4 months after therapy had begun, 5 showed a lesser frequency than at beginning of therapy. Of the remaining 8 patients, 4 exhibited no change (3 of whom already rated 0 at begin of therapy), while the rate of self-injury increased for the other 4 (3 of whom had also rated 0 at admission).

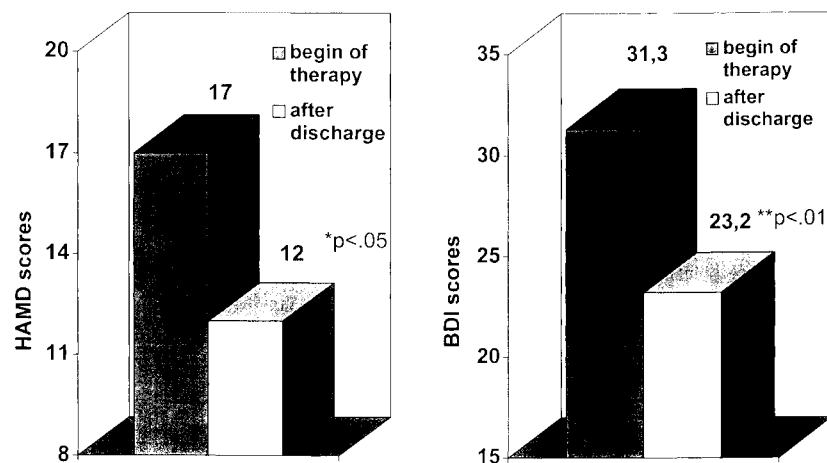


Fig. 2. Pre–Post comparison of depressive symptoms ( $n = 23$ ) using observation measures (HAMD) and self-reported measures (BDI); Premeasurement at the beginning of the therapy, postmeasurement after discharge (average inpatient treatment 3 months).

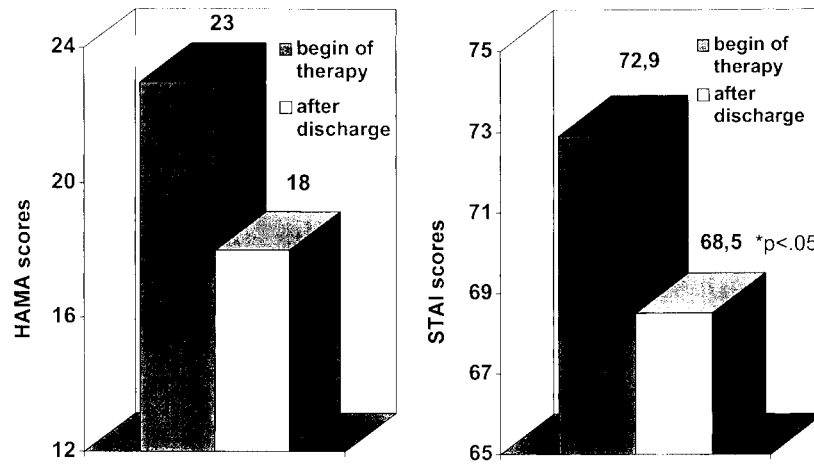


Fig. 3. Pre–Post comparison of anxiety symptoms ( $n = 24$ ) using observation measures (HAMA) and self-reported measures (STAI); Premeasurement at the beginning of the therapy, postmeasurement after discharge (average inpatient treatment 3 months).

There is a strong tendency towards an improved observer-based rating of depression scores on the HAMD and in the Trait-Anger scores on the STAXI. Observer-based rating of the anxiety values remained unchanged (Figs. 2 and 3).

According to Cohen’s recommendations (Cohen, 1988, 1992), the effect of therapy with regard to the rate of self-injury is estimated to be high, the strengths of effect in the areas of anger, anxiety and depression are midrange.

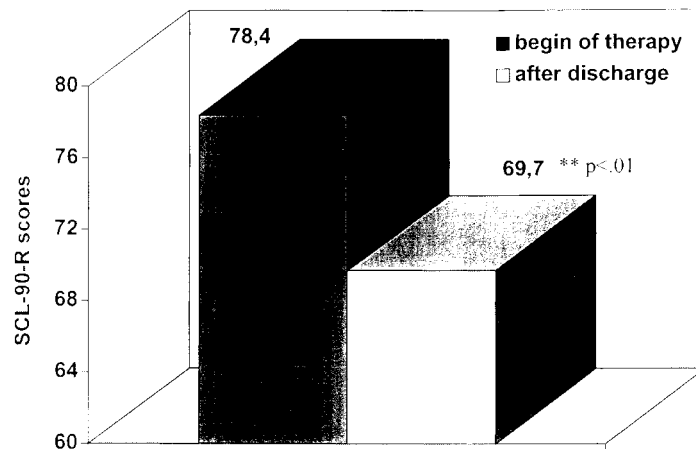


Fig. 4. Pre–Post comparison of the SCL-90-R scores ( $n = 24$ ); Premeasurement at the beginning of the therapy, postmeasurement after discharge (average inpatient treatment 3 months).

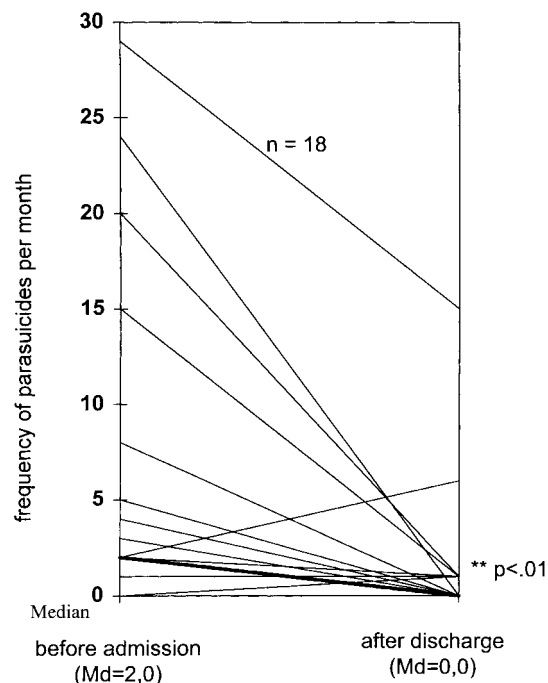


Fig. 5. Reduction of frequency of parasuicides among inpatients ( $n = 18$ ); Premeasurement at the beginning of therapy, covering the last 4 weeks before admission, postmeasurement 4 months after admission, covering the last 4 weeks.

## 9. Discussion

The study targeted a range of psychopathometric and behavioral changes in female patients with borderline personality disorder during and following a three-month inpatient program according to the guidelines of DBT. The second measurement point following the examination upon admission (first measurement point) was set at 4 weeks after discharge from hospital, since our clinical experience has shown this to be a critical point for many patients. The transfer of hospital experience into the everyday world, the confrontation with being alone, as well as taking leave from therapists and caregivers are all particularly difficult for borderline patients. The findings show significant to highly significant improvements on various levels. This holds true above all for the reduction in parasuicidal acts that is self-injurious, which function to reduce states of adverse tension. 16 out of 18 patients (88%), who had committed a self-injury in the month prior to admission, reduced this pattern of behavior in the first four weeks following release, 11 of them (61%), reduced this behavior to a level of 0. Three patients who had not cut themselves in the survey period prior to admission, reported single acts of cutting following release. One patient had 'learned' this dysfunctional technique of tension regulation for the first time on the ward. The results corroborate with our expectations. Inpatient DBT focuses upon self-injuries as high-ranking problem areas and works continuously towards developing skills for distress tolerance and emotion regulation. These skills generally are available as resources to the patients after approximately eight weeks.

The highly significant reduction of dissociative phenomena also corresponds to our expectations. Borderline patients often suffer from automatic or generalized derealization and depersonalization, as well as from a marked reduction of sensory afferences. Precisely this failure to perceive kinetic stimuli leaves them with the feeling that they have lost control over body functions and often signals the beginning of maladaptive spirals. Furthermore, states of dissociation appear to impair every type of cognitive learning, as well as habitative processes. Several modules of inpatient DBT are geared to reducing dissociation, including mindfulness skills (focusing on increasing control of awareness and reducing the tendency to judge experiences and events) training of sensory perception with the aid of therapists, physical therapy and hypnotherapeutic techniques. Improvement of dissociation is usually accompanied by a reduction in the number of flashbacks a highly relevant outcome for patients.

Although borderline patients taking Serotonin Reuptake Inhibitors (SSRI's) have demonstrated better mood stabilization in several open trials, we prescribed antidepressive medication for only one patient whose data was not included in the analysis. Nevertheless we found highly significant improvement of depressive symptoms revealed by BDI ( $p < 0.000$ ) and at least a strong tendency by the HAMD ( $p < 0.055$ ). The difference between the two instruments might be due to the fact, that the HAMD-asks for suicidal ideation, a cognition which is typical for borderline personality disorder and does not always correlate with depressive symptoms.

Results with regard to an improvement of anxiety are also controversial. While STAI and SCL5-Anxiety, both self-rating instruments, show significant to highly significant results, the same cannot be said for the HAMA. This might be due to the fact that enhanced physical perception (perhaps due to physical therapy and sensory training) led to a higher assessment of body-focused items of the HAMA.

The highly significant results of the SCL global dimensions 'total stress, symptoms and intensity' round off the picture. It is tempting to assess the improvements described on the behavioral level and in the mental state as the effects of inpatient DBT. However, the fact remains that these are uncontrolled data. Despite the fact that all the patients treated reported problems that had persisted for months and in some cases, for years, prior to admission, without a randomized trial the improvements can also be ascribed to a spontaneous course, to placebo expectancies, or to any number of other factors left uncontrolled in this trial. It remains open whether or not nonspecific factors such as the hospital stay itself, the attention paid by the caregivers, etc. as strong effect factors, might not also influence results. Even if the hospital experience and the literature continue to warn against a deterioration of the state of borderline patients in unstructured clinical settings, this issue can only be resolved by a randomized study.

Currently, the so-called effect-size (ES) is a widely accepted measure for the effectiveness of psychotherapy since it allows for the comparison between different treatment approaches.

Current studies in comparable areas, i.e. cognitive behavior therapy, which demonstrates the highest ES within the spectrum of the different types of therapy (Bergin & Garfield, 1994; Grawe et al., 1994), generally deal with disorder-specific treatments (e.g. anxiety, depression). Thus there are no comparative data available for long-term therapy of personality disorders. In such cases Cohen (Cohen, 1992) recommends three-part assessment of the effects: slight (0.30), moderate (0.50) and strong (0.80).

Thus, the average ES of 1.04, which has been found for inpatient DBT, can be regarded as a strong effect.

The same is true with respect to results concerning the reduction in the frequency of self-injury. According to Cohen, a value of 0.25 in a test of the deviation of a proportional value  $p$  from  $\pi=0.5$  represents a strong effect. On the other hand, these are preliminary results within the framework of the long-term therapy of a personality disorder and parameter-free procedures were employed because of violations of the normal distribution requirements.

Obtaining statistically significant results on the basis of parameter-free tests can only be expected in the case of strong effects. Despite the moderate effect sizes, we found no significant results in our tests. To achieve statistical significance with a moderate effect, a sample size of  $n = 97$  would be necessary according to Bortz and Lienert (1998).

Furthermore, the question is still open as to whether or not the improvements are stable. Follow-up studies of the patients will clarify additional issues. Outpatients receiving further treatment according to the guidelines of DBT following their inpatient treatment will be compared with those who receive nonspecific or psychodynamic treatment. Our major interest, however, is the extent to which the module 'Inpatient DBT' will accelerate and improve the outcomes following long-term outpatient DBT. The effect sizes presented here allow for the development of a randomized controlled design for testing this hypothesis. This project is currently in progress at our hospital and is funded by the DFG (German Research Foundation).

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