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Maximizing Skills Acquisition in Dialectical Behavioral Therapy with a CD-ROM-Based Self-Help Program: Results from a Pilot Study

Martina Wolf[a, b] Ulrich Ebner-Priemer[a] Elisabeth Schramm[d]
Melanie Domsalla[a] Martin Hautzinger[c] Martin Bohus[a]

[a]Department of Psychosomatics and Psychotherapy, Central Institute of Mental Health, Mannheim, [b]Department of Psychiatry and Psychotherapy, Medical Faculty, and [c]Department of Clinical and Developmental Psychology, Eberhard Karls University, Tübingen, and [d]Department of Psychiatry and Psychotherapy, University of Freiburg Medical School, Freiburg, Germany

Dialectical behavioral therapy (DBT) [1, 2] was designed to treat patients with borderline personality disorder (BPD), combining individual therapy with group skills training (ST). It has shown good treatment outcomes in several randomized controlled trials [3–9]. However, despite these promising data, DBT is not sufficient for all BPD patients. For example, Bohus et al. [10] reported large treatment effects, but only 60% of the participants experienced any clinically significant change. Clinical experience shows that nonresponders to DBT often have difficulties in learning skills in a group setting due to social anxiety, high levels of distress, dysfunctional thoughts and recurrent dissociation [11]. It has been suggested that the utilization of skills might play an important role for those who respond well to therapy [12]. In a study by Stepp et al. [13], increases in skills utilization were associated with a reduction in BPD features. Skills acquisition is the prerequisite for skills utilization. Therefore, maximizing skills acquisition in ST could improve skills utilization and the overall treatment effect of DBT. A CD-ROM-based self-help program (CBST; computer-based skills training) was developed to facilitate the learning process in ST [14]. The program was evaluated in a randomized controlled pilot study, comparing 2 forms of treatment for BPD patients: therapist-directed group ST with CBST as a treatment adjunct (ST + CBST), and a therapist-directed ST without an additional CBST module. We hypothesized that the ST + CBST would improve skills acquisition as well as increase the time spent studying skills, while reducing psychopathology compared to standard ST.

Forty female patients (18–65 years) were assessed by the International Personality Disorder Examination [15] at 2 different treatment centers: Central Institute of Mental Health (Mannheim) and University Department of Clinical and Developmental Psychology (Tübingen). To participate in the study, the patients had to fulfill diagnosis on the BPD spectrum (at least 4 DSM-IV criteria) and they had to participate in behavioral or psychodynamic individual psychotherapy. The exclusion criteria (assessed by SCID I) [16] were: schizophrenia, current substance dependence and severe cognitive dysfunctions. Thirteen patients had to be excluded due to substance dependence, personal circumstances such as problems to arrange childcare and nonacceptance of the study design, or because they did not fulfill at least 4 DSM-IV criteria. Three additional patients declined participation due to high levels of social anxiety in group settings. Twenty-four patients were randomized to 1 of 2 treatment groups: 13 patients to ST + CBST, and 11 patients to ST alone (without CBST). Both conditions (ST + CBST vs. ST) were conducted at each treatment center: 1 ST + CBST and 1 ST group. It was not possible to ensure that skills trainers were blind to condition, since CBST was implemented during the treatment sessions in the ST + CBST group. The patients in the ST groups did not have access to CBST. Minimization was conducted to ensure that an equal number of patients with individual psychodynamic and behavior therapists were included in each group. The study was approved by the ethics committee at the Faculty of Clinical Medicine in Mannheim. Written informed consent was obtained from all patients. Assessments took place 2 weeks before treatment and 1 week after completing the 24-week ST. The following assessments were administered. The Skills Acquisition Test (SAT) is a newly developed self-report questionnaire consisting of 57 multiple-choice questions to differentiate between people with different levels of skills knowledge. It was developed in cooperation with Marsha Linehan's research team in Seattle (Washington University). The Skills Structure Test (SST) assesses the ability to orga-

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Martina Wolf, PhD
DBT-program, Uppsala University Hospital
Banérgatan 22
SE–75237 Uppsala (Sweden)
Tel. +46 18 242 785, Fax +46 18 509 092, E-Mail martina.wolf@akademska.se

Table 1. Dependent t tests (within-group comparisons) of pre-post values, independent t test (between-group comparisons) of improvements after treatment and effect sizes for 2 treatment groups: ST + CBST (n = 10) and ST alone (n = 9); completer analysis

Variable (group)	Pretreatment mean ± SD	Posttreatment mean ± SD	d.f.	t	p	Within ES d	Improvements pre-post, mean ± SD	d.f.	t	p	Between ES d
SAT (ST + CBST)	18.20 ± 9.64	41.70 ± 6.53	9	–11.98	0.001	2.85	23.50 ± 6.20	–	–	–	–
SAT (ST)	20.00 ± 9.67	35.22 ± 7.98	8	–6.72	0.001	1.72	15.22 ± 6.80	17	2.76	0.01	1.27
SST (ST + CBST)	13.10 ± 6.69	38.80 ± 6.70	9	–7.36	0.001	3.84	25.70 ± 11.05	–	–	–	–
SST (ST)	11.22 ± 6.82	26.44 ± 7.84	8	–5.06	0.001	2.07	15.22 ± 9.02	17	2.27	0.04	1.04
BSL (ST + CBST)	2.23 ± 0.88	1.72 ± 0.85	9	3.97	0.003	0.59	–0.51 ± 0.41	–	–	–	–
BSL (ST)	2.01 ± 0.54	1.81 ± 0.70	8	1.34	0.216	0.32	–0.20 ± 0.45	17	–1.59	0.13	0.72
Time (ST + CBST)	–	3.38 ± 1.43	–	–	–	–	–	–	–	–	–
Time (ST)	–	2.14 ± 0.69	–	–	–	–	–	17	2.26	0.04	1.10

Time = Time spent studying skills per week (h) reported by patients; SD = standard deviation.

nize knowledge and to assign 63 important concepts of the ST to one of the skills modules. It was developed by the research team in Mannheim. In ST, the patients are constantly asked to name skills, to describe in what situations the skills should be used and to what module they are assigned. The Borderline Symptom List (BSL) is a self-rating instrument for borderline symptomatology. It contains a list of 95 subjective complaints and impairments often reported by borderline patients. The BSL revealed good psychometric properties with a high internal consistency (Cronbach's $\alpha = 0.97$) and a promising sensitivity for therapeutically induced change in borderline impairment [17, 18]. At the posttreatment assessment, the patients were also asked to write down an estimation of the weekly amount of time that was spent studying skills.

For practical and financial reasons, the ST consisted of 24 weekly sessions (duration: 2 h including a short break) and lasted for about 6 months (standard ST lasts for 1 year). The content of the ST was shortened and modified, but all other aspects followed the guidelines described by Linehan [2]. All groups were conducted by 2 skills trainers with a maximum of 8 patients. A total of 7 skills trainers participated in the study (the senior trainers were supervised monthly by an experienced DBT supervisor, the cotrainers were supervised weekly by the senior trainers). The individual therapists were able to contact the senior skills trainers on a weekly basis. CBST is a multimedia program with 7 main sections, including 1 section for each DBT skills module. Many handouts and worksheets, describing important skills concepts and suggesting different exercises, are available to the user. The program is interactive and includes several features to gain attention and increase treatment motivation (cartoons, graphics, recordings with a professional speaker, rewards and support).

There were no significant between-group age differences (ST + CBST group: mean = 35.85, SD = 7.45, range = 22–47; ST group: mean = 32.64, SD = 8.90, range = 23–46; $t = 0.96$, $p > 0.346$) and there were no significant between-group differences at pretreatment assessment with regard to borderline symptomatology (ST + CBST group: BSL mean = 2.19, SD = 0.87; ST group: BSL mean = 2.15, SD = 0.62; $t = 0.13$, $p > 0.898$), skills knowledge (ST + CBST group: SAT mean = 18.62, SD = 9.39; ST group: SAT mean = 23.45, SD = 11.58; $t = -1.13$, $p > 0.270$) or structure (ST + CBST group: SST mean = 12.69, SD = 6.90; ST group: SST mean = 11.00, SD = 6.51; $t = 0.61$, $p > 0.545$). A total of 5 patients (20.8%) dropped out of treatment, 10 completed the ST + CBST group and 9 patients completed the ST group.

As can be seen in table 1, there were significant improvements on the SAT (ST group: effect size (ES) = 1.72; ST + CBST group: ES = 2.85) and on the SST (ST group: ES = 2.07; ST + CBST group: ES = 3.84) in both groups from pre- to posttreatment assessment (completer analysis). The patients in the CBST + ST group showed significantly greater improvements in SAT and SST scores (between-group effect size: SAT = 1.27; SST = 1.04) compared to the ST alone group. The CBST + ST group also reported to have spent significantly more time studying skills per week. Reduction in psychopathology as assessed with the BSL was larger in the CBST + ST group but did not reach significance. The patients in the ST + CBST group answered 73% of the SAT questions correctly at the posttreatment assessment; in the ST group, 61% of the answers were correct.

Two important findings have emerged from this study. First, the results indicate that CBST as a treatment adjunct can improve skills acquisition during DBT ST. In particular, the patients in the ST + CBST group showed a stronger improvement regarding skills knowledge (SAT scores) and the ability to assign important concepts to one of the skills modules (SST scores). Furthermore, earlier studies suggest that there are high levels of acceptance among psychiatric patients with regard to computer-based treatment interventions [19–21]. In addition, both treatment groups showed high SAT scores after treatment (>60% of the answers in a multiple-choice questionnaire were correct). This finding is of importance given that most of the individual therapists were not certified DBT therapists and did not cooperate intensively with the skills trainers. In a typical DBT program, consultation meetings (including individual therapists and skills trainers) take place on a weekly basis. In other words, the results give some support to the assumption that ST is effective for skills acquisition as an independent DBT intervention (without the intense cooperation within a DBT program). Secondly, the ST + CBST group reported spending about

1 h and 15 min more per week studying skills compared to the patients in the ST group. About 20% (20.8%) of the patients dropped out of treatment. These results are consistent with other studies [22]. It has to be highlighted that 3 (9.1%) of the patients that were offered to participate in the study declined participation due to high levels of social anxiety. Thus, a group setting sometimes proves to be an unconquerable hurdle for patients, leaving CBST as an alternative.

The most important limitation of our study is the small number of participants. The lack of power can probably explain why the group differences on the BSL were not significant. Nevertheless, we revealed statistical group differences of pre- to posttreatment improvements on SAT and SST because of the large between-treatment effects. The lack of published and validated questionnaires and interviewer-rated tests is also a problem in the assessment of skills. Thirdly, even though the minimization was a method to control the influence of the different individual therapies on treatment outcome, the effects of this variable on treatment outcome remains unclear. In addition, CBST was developed by the research team conducting the study; it is unclear if the patients were influenced by this fact. Future studies should investigate if CBST can replace a therapist-directed ST for patients who are unable to find access to a therapist-directed ST.

Acknowledgements and Declaration of Interest

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