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Work-Related Treatment for Major Depressive Disorder and Incapacity to Work: Preliminary Findings of a Controlled, Matched Study

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The aim of this study was to compare the effectiveness of work-related cognitive-behavioral treatment (W-CBT) with that of cognitive-behavioral treatment as usual (CBT-AU) for employees on sick leave as a result of a major depressive disorder (MDD). We collected data for 26 matched outpatients at pre- and posttreatment, as well as at 1-year follow-up. Outcome measures were the days of incapacity to work (DIW) as well as self-report measures (Beck Depression Inventory [BDI], Symptom Checklist 90-R [GSI], Life Satisfaction Questionnaire [FLZ]). We analyzed data with hierarchical linear modeling in a 2-level model. Therapy effects were defined in 3 ways: effect size (ES), response (based on the reliable change index), and remission compared with the general population's symptom level. The DIW were reduced significantly after both types of treatment, but employees showed even fewer DIW after W-CBT. At follow-up, significantly more employees were working as a result of W-CBT than with CBT-AU. Significant improvements on scores of self-rating measures corresponded with moderate-to-large effect sizes for both treatment types. Approximately 2 thirds of the treated employees were categorized as unimpaired on BDI scores at posttreatment and at follow-up. At least 1 half of the employees were classified as unimpaired on GSI scores at both assessment points. In future research, a randomized controlled trial should be conducted using a larger sample size to investigate the impact of moderators (e.g., employees at different branches of the company). Findings provided support for using common CBT techniques to enhance return to work without losing expected improvements at the symptom level.

Keywords: effectiveness, clinical significance, return to work, sickness absence

Mood disorders are quite common in the working population. The 12-month prevalence rate varies between 3.4 and 6.0% for mood disorders in European countries (Alonso et al., 2004; Bijl, Ravelli, & van Zessen, 1998) and is 6.4% for major depressive disorder (MDD) in the United States (Kessler, Merikangas, & Wang, 2008). Recent research has estimated the economic burden

of mood disorders in Europe at €113.4 billion (US\$ 150.4 billion¹) for 2010 (Gustavsson et al., 2011). For example, the total costs for the four European countries with the highest national gross value (Germany, the United Kingdom, France, and Italy) were estimated to range between €12.4 and €24.6 billion (US\$ 16.4 billion and US\$ 32.6 billion). A large proportion of the costs mentioned above may be blamed on incapacity to work as a result of MDD, which is one of the most common mental disorders. If analyses by the World Health Organization (WHO, 2008) prove correct, MDD will hold the second place among illnesses that limit quality as well as quantity of life in the industrialized nations as of the year 2020. This prediction stands in line with a review of reports from several German health insurance companies (BPTK, 2011b, 2012), which concluded that the mean number of days of incapacity to work (DIW) as a result of mental disorders rose from 30% to 50% between 2000 and 2009. The majority of DIW—a share of 60% to 70%—were caused by depressive disorders. Therefore, the productivity loss and decreased national gross value caused by mental disorders in 2011 were estimated to be about €16 billion (US\$ 21.2 billion) in Germany (BAuA, 2013).

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¹ We used the exchange rate €1 = US\$ 1.3262, which was published by the European Central Bank on 01/02/2013, because the majority of cited studies were calculated in this period of time.

Given an aging workforce and a shortage of skilled employees, the reintegration of personnel into the workplace after prolonged periods of illness is of increasing importance for companies. Compared with employees with other mental health problems (e.g., burnout, anxiety symptoms), those who reported depressive symptoms were shown to have been absent longer due to sick leave (Bultmann et al., 2006; Nielsen et al., 2011). In addition, the longer the sick leave, the higher the probability that an employee will retire prematurely (Bultmann, Christensen, Burr, Lund, & Rugulies, 2008; Dekkers-Sánchez, Hoving, Sluiter, & Frings-Dresen, 2008; Wedegaertner et al., 2013). For these employees, absence attributable to long-term sickness results in reduced income. The sickness benefit that is paid by health insurance companies in Germany, for example, is currently about 70% of regular gross income before the sick leave absence. Furthermore, long-term sickness absence might have an additional negative impact on employees' life satisfaction as well as on their depressive symptoms. Patients might lose perceived social support, have negative recovery expectations, and feel ashamed (Brouwer, Reneman, Bültmann, van der Klink, & Groothoff, 2010; Knapstad, Øverland, Henderson, Holmgren, & Hensing, 2014).

Because MDD leads to substantial costs for the individual as well as for the employer and society, there is a need for psychological interventions that have proven their effectiveness in terms of costs saved and relief from depressive complaints. Ideally, such interventions will also enhance return to work (RTW). Yet recent reviews (NICE, 2009; Nieuwenhuijsen et al., 2008) have reported limited evidence of existing interventions for employees who are on sick leave due to depression. As an exception, psychiatric treatment as usual was compared with and without occupational therapy (OT). Although the addition of OT in the first study (Schene, Koeter, Kikkert, Swinkels, & McCrone, 2007) did not improve self-rated depression, it reduced DIW. An improved version of OT could increase long-term remission from depressive symptoms as well as long-term RTW in good health (Hees, de Vries, Koeter, & Schene, 2013). In addition, OT was cost-effective compared to psychiatric treatment as usual (Schene et al., 2007).

However, there are disorder-related forms of psychotherapy for the treatment of MDD that are evidence-based (e.g., APA, 2006; DGPPN, 2012; NICE, 2010). Even though these treatment forms should be combined with antidepressant medication for severely depressed patients, in general, patients prefer psychotherapy to pharmacological treatment (Angermeyer, Breier, Dietrich, Kenzine, & Matschinger, 2005; Tylee, 2001). Cost-benefit estimations for disorder-specific psychotherapy in Germany concluded that the financial benefit would outweigh the treatment costs if a moderate willingness on the part of depressive patients is assumed (Wunsch, Kliem, Grochowski, & Kröger, 2013). Based on this study, if a moderate treatment rate of 50% is assumed, costs in the amount of €337.3 million (US\$ 447.33 million) for productivity and €585.2 million (US\$ 776.1 million) for the national gross value could be saved per year due to the reduced number of DIW if employees suffering from depressive disorders were treated successfully and returned to work. However, these estimations assume disorder-related forms of psychotherapy without focusing on work issues which might reduce the impact on gained DIW.

Cognitive-behavioral treatment (CBT) is the most studied form of psychotherapy for MDD, resulting in at least moderate effect sizes on self-rated depression (Butler, Chapman, Forman, & Beck,

2006; Cuijpers et al., 2013). However, CBT does not directly target work-related issues that come along with depression, but effects on secondary outcomes point to its impact on work functioning: applying CBT in computerized (McCrone et al., 2004) or telephonic modalities (Lerner et al., 2012) resulted in improvements on self-rated work adjustment and work limitations. Although these findings indicate that CBT might be effective in enhancing work functioning, it is questionable whether this treatment approach enhances RTW of depressed employees. In addition, a focus in CBT on work issues, in particular RTW, is often missing (e.g., Kidd, Boyd, Bieling, Pike, & Kazarian-Keith, 2008; Hillert, Staedtke, & Cuntz, 2002), although work is a central part of human life. If psychotherapists help employees both to overcome depressive complaints and to work with them on RTW, DIW might be more reduced than if they only focus on depressive symptoms as it is common in CBT.

To the best of our knowledge, there is only one controlled study (Lagerveld et al., 2012) that compared CBT as usual to cognitive-behavioral treatment aiming at an early RTW. This study found that employees who were given the latter treatment returned to the workplace earlier, resulting in saved costs of about €3935 (US\$ 5218.6) for the company. A significant improvement in self-rated symptoms of stress, anxiety, and depression was equally reported for both treatment types. However, two thirds of participants met the criteria for adjustment disorders. Although MDD is quite common in the working population, employees who met the criteria for this disorder were excluded from this trial. Because employees with MDD are more impaired than those with adjustment disorders (Snyder, Strain, & Wolf, 1990), treatment of patients diagnosed with MDD should be investigated.

Therefore, the aim of the present study is to tackle this issue and to compare the effectiveness of work-related cognitive-behavioral treatment (W-CBT) that integrates disorder-specific elements as well as interventions to enhance RTW with cognitive-behavioral treatment as usual (CBT-AU) for employees on sick leave due to MDD. We hypothesized that (a) both treatment types would result in a decreased number of DIW as well as in a reduction of mental health complaints. Making the assumption that focusing on the workplace and monitoring the integration process during treatment might enhance employees' RTW, we hypothesized that (b) W-CBT treatment is more effective in reducing sickness-leave absence than CBT-AU. With respect to improving mental health complaints, we assumed that (c) W-CBT is just as effective as CBT-AU.

Method

Participants and Procedure

Written contracts between an outpatient clinic at a German university and four company health care insurance plans were drawn up to ensure that employees with mental disorders would receive psychotherapeutic treatment in which the workplace and RTW might be taken into consideration. Employees were recruited by case managers of health care insurance plans and occupational health physicians, who approached employees when mental disorders were suspected or detected. They then provided information about the project and asked the employee whether the case manager could arrange an appointment with the outpatient clinic.

Thirty-six employees with suspected mental disorders were screened consecutively in the period from January 2008 to June 2009 at an outpatient clinic. For the diagnosis of mental disorders, the German version of the Structured Clinical Interview for *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (*DSM-IV*) Axis I Disorders (SCID-I; Wittchen, Wunderlich, Gruschitz, & Zaudig, 1997) was used. Three trained and licensed psychotherapists conducted the interviews. They were blinded to the allocation of the treatment groups and did not offer any treatment or supervision. Interviewers had been trained in the administration and scoring of these instruments in a 2-day-workshop by the first author, who in turn had been trained by the first author of the German version of the SCID-I. The interrater reliability coefficient was median $\kappa = 1$ ($0.77 \leq \kappa \leq 1$) at posttraining. The interviewers met once a week and discussed the ratings of the diagnoses in question as based on the videotapes. They checked the criteria of *DSM-IV* diagnoses and, if needed, patients were contacted a second time to gather more information.

Participants were eligible for inclusion if they were above the age of 18 years, employed, but had been on sick leave within the last 21 working days, and met the *DSM-IV* criteria of MDD. We excluded patients who showed indications of mental retardation or dementia as well as patients with substance dependence disorders, bipolar disorders, schizophrenia, or anorexia nervosa. Patients

experiencing other mental disorders were not excluded. All participants had undergone a medical examination by a general practitioner or an occupational health physician before starting the treatment. Each patient was informed in writing about the course of the study and was required to provide their written consent. The Ethical Review Committee of the Technical University of Brunswick, Germany, approved the study.

Figure 1 displays the flowchart. It shows that 36 patients agreed to participate, while a total of 10 employees were excluded because they were not on sick leave ($n = 7$), did not meet the criteria of any mental disorder ($n = 2$), or fulfilled the criteria of alcohol dependence. A total of 26 employees, 8 (31%) of whom were female, met the inclusion criteria. Eligible patients were matched on gender and age (± 2 years). Afterward, one member of each pair was randomly allocated to either W-CBT or CBT-AU.

The mean age of the participants was 41.85 years ($SD = 10.06$), all were Caucasian, and all worked at steel and automobile firms and their supply companies. Table 1 shows the sociodemographic data and the frequencies of comorbid mental disorders. A total of 16 participants (62%) reported a first episode of MDD, whereas 5 participants (38%) met the criteria for a recurrent disorder, with 2 to 3 episodes. On average, each patient had 1.30 ($SD = 0.57$) comorbid mental disorders. One-third had received psychiatric inpatient treatment before. No between-groups differences were

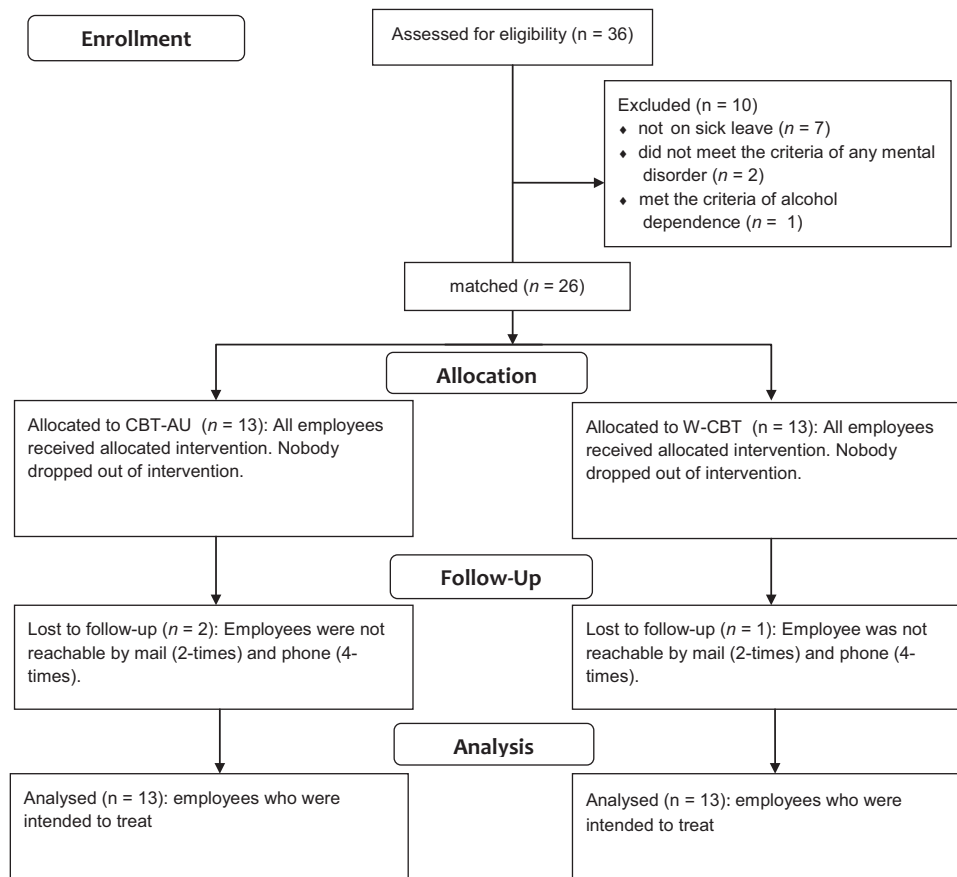


Figure 1. CONSORT flowchart. CBT-AU = cognitive-behavioral treatment as usual; W-CBT = work-related cognitive-behavioral treatment.

Table 1
Socio-Demographic Characteristics

Characteristic	CBT-AU		W-CBT	
	<i>n</i>	%	<i>n</i>	%
Men	6	46	8	62
Marital status				
Married	6	46	5	38
Intimate relationship	2	15	0	0
Divorced/separated	2	15	3	23
Single	3	23	5	38
School-leaving qualification				
Lower-track	2	15	4	31
Medium-track	3	23	5	38
University entrance level	3	23	2	15
Applied university certification	5	38	2	15
Employment status				
Blue collar workers	4	31	5	38
White collar workers	9	69	8	62
Prior treatments				
Psychiatric inpatient	4	31	4	31
Psychotherapeutic outpatient	4	31	2	15
Mental disorders				
Primary diagnoses				
First major depression disorder	8	62	8	62
Recurrent major depression disorder	5	38	5	38
Additional diagnoses				
Anxiety disorders	5	38	4	31
Alcohol abuse disorder	3	23	2	15

Note. CBT-AU = cognitive-behavioral treatment as usual; W-CBT = work-related cognitive-behavioral treatment.

found in terms of the sociodemographic data and the frequencies of comorbid mental disorders. Employees were assigned to therapists within one week, as the therapists became available.

Therapists

Seven therapists (three male, four female) carried out the treatment. They were taking part in a postgraduate cognitive-behavioral training program that included a 2-day workshop for cognitive-behavioral treatment for depressive disorders. The workshop was led by an internationally known trainer and researcher in the field (Martin Hautzinger, University of Tübingen, Germany). Each therapist had treated at least two cases of MDD before the study. In addition, they were required to read written instructions for the obligatory work-related assessments, and participated in a 2-hr workshop in which aims and procedures of the work-related treatment were introduced. Furthermore, therapists met with the first author once a month. During these meetings, issues connected with work and RTW could be clarified and related questions were answered. Therapists offered treatment in both W-CBT and CBT-AU. During the treatment phase, supervision in a group format (with a maximum of 4 therapists and a 2-hr duration) was offered at least once a month by four state-recognized supervisors for CBT. The therapists could contact their supervisors in case of suicidality or worsening of symptoms, or if they had questions regarding labor and social law. Supervision was based on verbal reports by the therapists as well as on videotaped sessions.

Support by Case Managers and Occupational Health Physicians

Professional social security case managers from the health care insurance plans provided support for insured persons. They scheduled the first appointment at the outpatient clinic, assembled all medical reports from previous treatments, and made these reports available to the assigned therapists. They also offered consultations with patients regarding sociomedical questions (e.g., making an application for family support).

All the occupational health physicians were trained in psychosomatic basic health care (80 hours). They released patients from work for therapy sessions, reinforced cognitive and behavioral changes at frequent intervals during treatment, consulted employees about the timing of reintegration, ensured positive changes at the workplace to support mental health, and initiated talks between superiors and employees. They were blind for the treatment conditions.

Treatment

For both treatment types, the diagnostic examination encompassed a detailed exploration of current symptoms and medical and life history, including the use of various self-assessment questionnaires. The subsequent cognitive-behavioral therapeutic treatment for depression followed a standard German manual (Hautzinger, 2013), and included (a) behavioral activation, (b) psychoeducative recommendations for a cognitive-behavioral model, (c) identification of negative automatic thoughts that were monitored in daily life or elicited during the sessions, (d) discussions of dysfunctional thoughts in order to evaluate and modify cognitive bias, (e) a step-by-step training for interpersonal skills to improve assertiveness and strengthen relationships to significant others, (f) relapse prevention strategies (e.g., to list helpful techniques that were learned during treatment), and (g) session-to-session homework assignments (e.g., to complete a Dysfunctional Thoughts Record). Co-occurring anxiety disorders were treated in accordance with standard German disorder-related manuals (e.g., Margraf & Schneider, 1990, for panic disorder). The treatment amounted to 24.00 weekly sessions ($SD = 1.23$, min. = 20, max. = 25 sessions) for both treatment types, including two to three booster sessions. In accordance with the National Disease Management Guideline "Unipolar Depression" (DGPPN et al., 2012), three participants (with two in CBT-AU) took serotonin reuptake inhibitors due to severe depressive symptoms.

Work-related assessments. When employees were assigned to W-CBT, a detailed workplace anamnesis was taken in order to check whether work was a possible causal factor for the depressive symptoms, whether work constituted a condition that was maintaining the disorders, or whether work might represent a resource for the patients. In this respect, the objective working conditions were analyzed (e.g., type of work contract, features of the workplace) and patients were asked for their own assessment or evaluations (e.g., work motivation, satisfaction in the workplace, perception of burdens at the workplace, assessment of relationships with colleagues). Therapists in the W-CBT condition got precise descriptions of the workplace and work tasks in written form. These descriptions were prepared by the occupational health care physicians. In individual cases, an assessment by the superiors was

also obtained. The patients received detailed feedback about the findings, which formed the basis for the individual therapy plan.

Work-related interventions. In the W-CBT condition, therapists were instructed to endorse work-related interventions as follows: (a) In providing the individual reintegration model, the workplace was regarded as a resource of self-efficacy and self-worth. Whenever it was possible during therapy sessions, therapists labeled the workplace as such a resource and an important part of life satisfaction. For example, when explaining the loss of reintegration-model, the workplace is referred to as resource for social contacts, self-esteem and positive reinforcement. (b) When problems arose in the workplace, they were identified and tackled within the framework of problem-solving training. Afterward, strategies were developed to reduce the employees' burden in the workplace and increase their capability at work (e.g., introduce regular short breaks and self-instruction). (c) The skills successfully applied in the workplace were transferred to other problematic areas (e.g., also granting oneself a time-off at home) and vice versa. If the employees experienced recognition and appreciation of their performance in the workplace, this could be related to other problematic life areas and thus reduce the perceived burden. At the same time, when behavioral activation was established, it enhanced RTW. (d) For all patients, a plan for reintegration was developed on a form and its implementation was therapeutically supported. This reintegration plan involved gradually increasing the employee's work hours, a calculation of how many hours would be worked each week, an estimate of time spent on the employee's main and auxiliary tasks, an estimate of how much stress was provoked while carrying out each task, as well as optional notes regarding time management and instructions that were meant to be supportive (e.g., rules for breaks, protocols for handling disturbances). During the reintegration phase, employees completed a report that included daily tasks and their duration per day or per week, measures for adapting the workplace to the employee's personal capacity either by the employee himself or by his employer, and an assessment of employee satisfaction in carrying out the tasks. (e) In this respect, hurdles that arose during the reintegration phase were identified and removed where possible (e.g., disputing dysfunctional thoughts and changing physical working conditions). (f) The occupational health physicians and the employees' superiors were included in the therapy if possible. If necessary, the therapists resumed an intermediary role between the parties in which, for instance, they prepared conflict resolution meetings or expressed recommendations for necessary changes to the workplace.

Treatment integrity. In the W-CBT condition, therapists and supervisors were instructed to focus regularly on employees' work during the monthly supervision sessions, but they did not follow a session-to-session manual that was worked out prior to the treatment. Therefore, therapists were flexible as to choice, timing, and adaptation of work-related interventions in terms of the patients' needs and companies' requirements. In the CBT-AU condition, therapists were not allowed to conduct any work-related assessments or interventions, as described in detail above. Interventions and their impact on the therapeutic process and on symptoms were documented by therapists in session protocols that were checked monthly by the supervisors. In addition, therapists summarized the work-related assessments, the treatment process, and the outcome,

in written interim and final reports. In the CBT-AU condition, we did not detect any written note on session protocols, any videotape or any therapists' report in the supervision in which work-related assessments and interventions were reported.

Two independent bachelor-level research assistants counted the number of work-related interventions that were conducted by therapists (viewing the workplace as a resource, solving work-related problems, transferring skills to daily life, and to the workplace, outlining a plan for reintegration, trying to overcome hurdles during the reintegration phase, and including occupational health physicians and the employees' superiors) by rating videotapes from 70% of the treatment sessions. Intraclass correlation (ICC) coefficients were calculated as indices for rater-agreement. In accordance with Fleiss (1981), values of ICC coefficients were found to be excellent (>0.75), ranging from ICC = .85 to .98. The number of work-related interventions per therapy session was on average 2.8 ($SD = 0.9$) for W-CBT and 0.6 ($SD = 0.4$) for CBT-AU, indicating that therapists used more work-related interventions in W-CBT than in CBT-AU, $t(1,25) = 8.935, p < .001$.

Measures

Sickness-leave absence. Using data from health care insurance plans, we calculated the DIW per 100 calendar days within one year before and after treatment, respectively. This DIW quote is often used in reports from German health insurance companies.

Beck Depression Inventory (BDI; Hautzinger, Bailer, Worall, & Keller, 1995). The German version of the BDI consists of 21 items that assess the occurrence and severity of typical depressive symptoms within the last 7 days. In the present study, the value of internal consistency was Cronbach's alpha = .92.

Symptom-Checklist 90-Revised (SCL-90-R, Franke, 1995). The German version of the SCL-90-R was used to measure general symptom strain. Participants rated 90 items as to how much they had suffered from problems in the past week. The 90 items can be summarized to the Global Severity Index (GSI), which is frequently used as a measure of success. In this study, the internal consistency of the GSI amounted to Cronbach's alpha = .97.

Life Satisfaction Questionnaire (Fragebogen zur Lebenszufriedenheit, FLZ; Fahrenberg, Myrtek, Schumacher, & Brähler, 2000). The FLZ consists of 49 items used to measure current general life satisfaction. In the present study, the internal consistency of the FLZ amounted to Cronbach's alpha = .95.

Statistical Analyses

Missing data. A bachelor-level research assistant checked the self-rating measures for missing data and asked patients to complete data when necessary. Therefore, there was a low rate of missing data on the self-rating measures. Four participants did not answer the self-rating questions at the follow-up assessment. No significant intergroup differences were found in any of the variables for completers and noncompleters. In accordance with Acock (2005), we used full information maximum likelihood estimation to handle the missing data problem. For this approach, all observed information is used to produce the maximum likelihood estimation of parameters. This estimation procedure has major advantages over traditional approaches (e.g., it is less biased, more efficient,

and has optimal type-one error rates) across different missing data conditions (Enders, 2001; Enders & Bandalos, 2001).

Effectiveness. Using the interquartile range outlier method (Carling, 2000), no outlier was detected. Mean differences at pre- and posttreatment were tested by t test or Fisher's exact test, depending on which scales of measurement were provided. We used hierarchical linear modeling (Raudenbush & Bryk, 2002) to account for the nested data structure, with longitudinal assessment data nested within subjects. This technique was more appropriate for our study than the commonly used repeated measure ANOVA, because it allows within-subject heterogeneity (Keselman, Algina, & Kowalchuk, 2001). Since the mean pretreatment FLZ score differed between W-CBT and CBT-AU, we included these values as a covariate in further analyses. Given that the DIW quote is a count variable and positively skewed, a Poisson mixed-effects regression was used for the analyses involving DIW as the outcome. The model for treatment differences with regard to the DIW quote is shown in the following formula:

$$\text{Level 1: } \text{Log}(E[\text{variable}_{it}]) = \pi_{0i} + \pi_{1i}(\text{Time})_{it} + e_{it}$$

$$\text{Level 2: } \pi_{0i} = \beta_{00} + \beta_{01}Tx + \beta_{02}(\text{FLZpre}) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11}Tx + \beta_{12}(\text{FLZpre}) + r_{1i}$$

with t = time (pre = 0, 1-year follow-up = 1), i = individuals, and the linear predictor connected to the mean of the DIW quote via a natural logarithm link function (Atkins et al., 2013). The model for treatment differences on dimensional data across time is shown in the following formula:

$$\text{Level 1: } \text{variable}_{it} = \pi_{0i} + \pi_{1i}(\text{Time})_{it} + e_{it}$$

$$\text{Level 2: } \pi_{0i} = \beta_{00} + \beta_{01}Tx + \beta_{02}(\text{FLZpre}) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11}Tx + \beta_{12}(\text{FLZpre}) + r_{1i}$$

with: t = time (pre = 0, post = 1, 1-year follow-up = 2), i = individuals, Tx = dummy-variable for treatment type (1 = W-CBT; 0 = CBT-AU), β = cross-level interaction between time and treatment type, and r = heterogeneity in participants' trajectories. In both models, the growth parameter, the initial status (intercept), and the pretreatment FLZ score were modeled as random effects which vary across individuals on level 2.

In accordance with Gibbons, Hedeker, and Davis (1993), Hedges' g was computed as an estimation of effect sizes (ES) for within-treatment change. For interpreting this estimate, Cohen (1988) suggested a classification whereby ES values of d were rated as small (>0.2), medium (>0.5), and large (>0.8). In order to use this conventional framework, we corrected the values of Hedges' g to g^* , taking into consideration any possible bias due to the small sample sizes (Hedges & Olkin, 1985).

Response. In accordance with Jacobson and Truax (1991), we calculated the reliable change index (RCI), which allowed us to determine the percentage share of patients who remained unchanged or reliably improved or deteriorated. An RCI above the 95% confidence limits ± 1.96 counts as evidence of a reliable change ($p \leq .05$). Using data from the reference populations, critical values of 10.36 for BDI scores, 0.27 for SCL-90-R scores, and 21.23 for FLZ scores were calculated. Patients were counted as having responded when the difference between pre- and post-mean value as well as the difference between pre- and follow-up mean value exceeded the critical value.

Remission. To establish whether responders can also be regarded as remitted, the cut-off point C was calculated (Jacobson, Roberts, Berns, & McGlinchey, 1999). This cut-off point was favored because it takes into account the overlapping of the two distributions of normal and impaired populations. Using data from the reference populations, critical values of 9.79 for BDI scores, 0.57 for SCL-90-R scores, and 254.78 for FLZ scores were calculated. If a responding patient exceeded the respective cut-off point C , he was regarded as being remitted and within in the range of the general population. The analyses were conducted with the HLM 7 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011) and IBM SPSS Statistics 21.

Results

Descriptive Data

Table 2 displays the means and standard deviations of the four outcome measures. The mean pretreatment DIW quote of 13.5 ($SD = 0.10$) for both treatment types was almost identical to the

Table 2
Means and Standard Deviations on Outcome Measures

Measure	CBT-AU				W-CBT							
	Before treatment		After treatment		Before treatment		After treatment					
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
DIW-quote	0.14	0.10	0.07	0.09	0.13	0.10	0.01	0.03				
Self-rating measures	Pretreatment		Posttreatment		1-year follow-up		Pretreatment		Posttreatment		1-year follow-up	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
	BDI	20.92	4.59	10.85	7.30	9.62	7.11	20.23	5.73	7.08	6.32	8.77
GSI (SCL-90-R)	0.97	0.36	0.69	0.43	0.48	0.35	1.09	0.61	0.51	0.52	0.13	0.17
FLZ	207.00	40.36	227.23	40.71	236.46	37.52	245.77	36.37	264.31	35.23	263.08	32.95

Note. CBT-AU = cognitive-behavioral treatment as usual; W-CBT = work-related cognitive-behavioral treatment; DIW-quote = days of incapacity to work/100 calendar days; BDI = Beck Depression Inventory; GSI (SCL-90-R) = Global Symptom Index of the Symptom Checklist 90-Revision; FLZ = Fragebogen zur Lebenszufriedenheit (Life Satisfaction Questionnaire).

quote that was cited for insured participants with depressive episodes in the relevant health care insurance reports for the year 2009 ($M = 13.34$, $SD = 0.53$; BKK, 2010). All participants reported a BDI score ≥ 15 points. The mean pretreatment BDI score was 20.58 ($SD = 5.20$), indicating a moderate level of depression (Hautzinger et al., 1995). The mean pretreatment GSI score of 1.03 ($SD = 0.48$) was more than two standard deviations above the GSI value of a German representative sample ($M = 0.38$, $SD = 0.33$; Hessel, Schumacher, Geyer, & Brähler, 2001), indicating a high level of symptom strain. However, the mean pretreatment FLZ scores differed between the treatment conditions, $t(24) = 2.573$, $p = .017$, indicating a lower life satisfaction in CBT-AU than in W-CBT. The mean FLZ score in CBT-AU ($M = 245.77$, $SD = 36.37$) was more than one standard deviation from the mean score of a German representative sample ($M = 254.91$, $SD = 38.90$; Fahrenberg et al., 2000).

Effectiveness

All participants began and finished treatment. Table 3 and Table 4 show the effects of interventions on outcome measures and the ES, respectively. The DIW quote was reduced significantly in both treatment types with large intra-Group ES. In addition, there was a time \times group interaction, indicating that the DIW quote decreased even more as a result of W-CBT. Although the mean pretreatment FLZ score was associated with the DIW quote and the BDI scores at pretreatment, no pretreatment FLZ \times time interaction was found, indicating that life satisfaction had no impact on the treatment course. There was no between-groups difference in terms of early partial RTW, Fisher’s exact test, $p = .722$. Eight versus six employees who had W-CBT and CBT-AU, respectively, returned to the workplace on a part-time basis. Starting with a minimum of 4 hours per work day, those employees were integrated over a 4- to 6-week period of time, so that full RTW was achieved. At follow-up, the number of employees who worked differed significantly, in favor of W-CBT (13 vs. 8 employees), Fisher’s exact test, $p = .039$.

As expected for both treatment types, BDI and GSI scores decreased significantly over time, whereas the FLZ scores in-

creased significantly. As displayed in Table 4, the intra-Group ES on scores of self-rating measures were large ($ES = 0.84$ to 1.69), with one exception for the FLZ score at follow-up assessment for W-CBT ($ES = 0.56$).

Response and Remission Rates

Table 5 displays the response and remission rates depending on the self-rating measures. At least two thirds of the employees were classified as unimpaired on the BDI scores at posttreatment and at follow-up for both treatment types. Additionally, at least one half of the employees were classified as unimpaired on the GSI scores at both assessment points. However, a general symptom strain corresponding to that of the general population was shown more often for W-CBT at follow-up, Fisher’s exact test, $p = .048$. About two thirds of participants in W-CBT and one third of those in CBT achieved a level of life satisfaction corresponding to that of the general population. No further intergroup differences emerged.

Discussion

The aim of the present study was to compare the effectiveness of W-CBT and CBT-AU for employees on sick leave due to MDD. As expected, both treatment types reduced the DIW significantly, but employees showed even less DIW in the period of time between posttreatment and follow-up assessments when they received W-CBT. Consistent with Lagerveld et al. (2012), significantly more employees were working at 1-year follow-up having had W-CBT than for CBT-AU. At that time point, two thirds had returned to work and were unimpaired in terms of self-rated depressive symptoms.

Given the mean costs per day of absence, which are estimated at €272 (US\$ 360.7) in Germany (BAuA, 2013), the benefit for the companies was estimated at €3264 (US\$ 4328.7) versus €1644 (US\$ 2180.2) per employee, within 100 calendar days for W-CBT and CBT-AU, respectively. Assuming an average monthly unemployment benefit payment of €822 (US\$ 1090.1), health care insurance plans saved about €324 and €162 (US\$ 429.7 and US\$ 214.8) per individual within the same period of time, respec-

Table 3
Effects of the Interventions on the Course of Days of Incapacity to Work, Depressive Symptoms, General Symptom Strain, and Life Satisfaction

Fixed effect	DIW-quote ^a		BDI		GSI (SCL-90-R)		FLZ	
	B	SE	B	SE	B	SE	B	SE
Intercept	-2.10***	0.19	17.45***	1.16	0.87***	0.10	208.72***	11.28
Time	-0.66**	0.22	-4.88***	0.90	-0.22***	0.04	15.05**	4.99
Pretreatment FLZ (grand mean centered)	-0.01*	0.01	-0.06***	0.02	-0.01	0.002	Not included.	
Condition (W-CBT = 1)	0.16	0.28	1.33	1.64	0.23	0.19	39.78**	15.08
Condition \times Time	-1.75*	0.70	-1.03	1.62	-0.14	0.10	-4.72	7.20
Pretreatment FLZ (grand mean centered) \times Time	0.0002	0.01	0.01	0.02	0.001	0.001	Not included	
Random effect	Variance component		Variance component		Variance component		Variance component	
Intercept	0.0197		1.09		0.134***		34.13***	
Time	0.040		4.34		0.016		11.006*	

Note. Significant difference between the intervention groups were reported at the $p < .05$ level (*), $p < .01$ level (**), and $p < .001$ (***). See further abbreviations in note of Table 2.

^a Poisson mixed regression model was used.

Table 4
Effect Sizes and Confidence Intervals (95%) on Outcome Measures

Measure	DIW-rate	BDI	GSI (SCL-90-R)	FLZ
CBT-AU				
Prior treatment/at follow-up	0.79 [0.62; 0.97]			
Pre- to posttreatment		1.28 [1.00; 1.56]	0.85 [0.67; 1.04]	0.88 [0.70; 1.06]
Pretreatment to follow-up		1.51 [1.19; 1.84]	1.28 [1.00; 1.56]	0.84 [0.76; 1.02]
W-CBT				
Prior treatment/at follow-up	1.30 [1.01; 1.58]			
Pre- to posttreatment		1.63 [1.28; 1.98]	1.24 [0.97; 1.51]	0.91 [0.73; 1.09]
Pretreatment to follow-up		1.51 [1.19; 1.84]	1.69 [1.00; 1.56]	0.56 [0.45; 0.67]
Inter-group differences				
At posttreatment		0.35	0.39	0.03
At follow-up	0.50	0.00	0.41	-0.29

Note. See abbreviations in note of Table 2.

tively. Although the overall saved costs for a single case might appear small, the reduction of costs caused by MDD is relevant in the face of its prevalence in the working population. It is important to note that we could not calculate any further costs that might be saved (e.g., physician visits, costs attributable to “presenteeism,” or the costs of recruiting replacement personnel). Future research should examine the cost-effectiveness of W-CBT, considering direct and indirect costs as well as possible intangible benefits (e.g., improved quality of life, reduced liability) for the employees, the health care insurance firms, and the employers.

Consistent with Lagerveld et al. (2012) and Hees et al. (2013), we found that self-rated depressive symptoms were reduced for W-CBT in the present study. The amount of reduction for both treatment conditions was in line with randomized controlled trials that investigated individual CBT ($d = 0.83$ to 2.33 ; Dimidjian et al., 2006; Elkin et al., 1989; Jarrett et al., 1999; Smit et al., 2006). Approximately two thirds of the treated employees were categorized as unimpaired on BDI scores after treatment. As expected,

the level of general symptom strain decreased and the level of life satisfaction improved over time for both treatment types. At follow-up, the general symptom strain of employees who worked corresponded to the symptom strain of the general population. Hence, the co-occurrence of mental disorders and physical illnesses might also be important in predicting sustainable work-time for depressed patients.

The fact that no employees dropped out of the study might be the result of close cooperation between the health care insurance firms’ case managers and the occupational health physicians. In accordance with the perspectives of employees, superiors, and occupational health physicians (De Vries, Koeter, Nabitz, Hees, & Schene, 2012), factors promoting RTW (adaptation of work, support in the workplace, and supportive health care) were realized as far as possible. Moreover, these patients obtained psychotherapy within 1 week, whereas the waiting period for an initial psychotherapeutic interview in Germany is usually about 3 to 6 months (BPTK, 2011a). This might be a further moderator effect on the employees’ compliance and RTW.

Table 5
Clinical Significant Outcome on the Self-Rating Measures

Measure	CBT-AU				W-CBT			
	Posttreatment		1-year follow-up		Posttreatment		1-year follow-up	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
BDI								
Deteriorated	0	0	0	0	0	0	1	8
Unchanged	6	46	5	38	5	38	4	31
Improved	7	54	7	54	8	62	8	62
Unimpaired	8	62	8	62	10	77	9	69
GSI (SCL-90-R)								
Deteriorated	1	8	0	0	0	0	0	0
Unchanged	4	31	4	31	2	15	2	15
Improved	6	46	9	69	11	85	11	85
Unimpaired	7	54	6	46	9	69	11	85
FLZ								
Deteriorated	0	0	0	0	0	0	1	8
Unchanged	6	46	6	46	7	54	9	69
Improved	7	54	7	54	6	46	3	23
Unimpaired	5	38	4	31	9	69	9	69

Note. See abbreviations in note of Table 2.

The major limitation of the study is that no computerized method of minimization for allocation was conducted. We only matched gender and age. Because of the small sample size, no other possible prognostic factors (e.g., work disability; see Lagerveld et al., 2010, for a review) were balanced and no further covariates (e.g., industry sectors) were included. Although our results were stable, including the between-groups difference on the pretreatment FLZ scores, future studies might incorporate general life satisfaction as a stratum. Furthermore, the outcome measure for depressive symptoms was only a self-rating instrument and not an expert's rating. Hence, the mean BDI score might underestimate the level of depression (e.g., Eaton, Neufeld, Chen, & Cai, 2000). Although relapses might be expected at any time within the first year after treatment for about 40% of patients (Dobson et al., 2008), we did not assess depressive symptoms more frequently than at 1 year posttreatment. In addition, the therapists' performance was not evaluated by blind assessors. However, we ensured treatment integrity by continuous supervision, checking the written session protocols and comparing the number of work-related interventions in both treatment conditions.

As opposed to Lagerveld et al. (2012), we could not examine the time lapsed until a patient had (partially) returned to work. In Germany, a gradual return to work is a condition of sick leave that is not commonly enabled in companies. Moreover, gradual RTW might be judged as not possible or suitable to specific workplaces (e.g., control of blast furnaces, robots, and welding systems). Therefore, an agreement in terms of a procedure for full-time RTW ought to be reached between management boards, employee representatives, and health care managers. Future research should consider standardized procedures for full-time and gradual RTW to examine whether these types of RTW procedure serves as a moderator for DIW rates after a period of sick leave. To address all these issues and to examine the degree of transferability to several patient groups, a randomized, controlled trial using a larger sample size is needed.

The present study provides support for using common CBT techniques to enhance RTW during treatment without losing expected improvements on the symptom level. We used work-related problem-solving strategies (e.g., problem-solving trainings, implementing functional self-instruction), developed a plan for reintegration, promoted self-management strategies (e.g., applying new skills and self-evaluation) at the workplace, and, in general, followed the train-on-the-job principle. These techniques are not specific for the treatment of MDD. Although this should be examined in future research, we believe that these common CBT techniques might also prove to be effective when treating patients experiencing other mental disorders than MDD (e.g., anxiety or somatoform disorders). In comparison with processing a structured 6-sessions-manual during an early stage of treatment, as was done in the W-CBT condition of the Lagerveld et al. (2012) study, therapists in the present study were instructed to apply work-related interventions whenever it seemed appropriate with regard to depressed patients' needs and company requirements. Hence, they might be more flexible in terms of choice and timing of work-related interventions. Although the work-related assessments and interventions in the present study appear quite similar to those applied in adjuvant OT (Hees et al., 2010), treatment conditions differed in therapeutic format (individual vs. group sessions), dose (24 individual sessions vs. 9 individual plus 9 group sessions in

OT), and application (all-in-one treatment vs. adjuvant OT and psychiatric care as usual). Furthermore, assignment of professionals (licensed psychiatrists, licensed psychotherapists, occupational therapists) and the time required for patients result in different personnel costs per treatment hour. In sum, differences in treatment approaches might impact the effectiveness of depressive complaints and the time point of RTW, as well as on cost-effectiveness. These factors might be examined in a comparative study with W-CBT and adjuvant OT plus psychiatric care as treatment conditions. To examine the underlying mechanisms that might predict the time point of RTW, and which interact with treatment approaches, future research should consider the mediator effects of different coping styles (van Rhenen, Schaufeli, van Dijk, & Blonk, 2008), self-efficacy, and perceived social support (Brouwer et al., 2010).

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