Group treatment for Complex Dissociative Disorders: A randomized controlled trial

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Abstract

Patients with complex dissociative disorders report high levels of childhood- abuse experiences, clinical comorbidity, functional impairment, and treatment utilization. Although a few naturalistic studies indicate that these patients can benefit from psychotherapy, no randomized controlled trials have been reported with this patient-group. In the current study, 59 patients with Dissociative Identity Disorder (DID) or Other Specified Dissociative Disorders (OSDD) were randomized to 20 sessions of stabilizing group – treatment, conjoint with individual therapy, or individual therapy alone, in a delayed-treatment design. The treatment is based on the manual *Coping with Trauma-Related Dissociation* (Boon, Steele, & Hart, 2011). The primary outcome was Global Assessment of Functioning (GAF), while secondary outcomes were PTSD and dissociative symptoms, general psychopathology, interpersonal difficulties, and self-destructive behavior. Results indicate medium to large effects on psychosocial functioning and small to insignificant effects on reduction of symptoms and self-destructive behavior. Mixed effect models showed no condition x time interaction, indicating no immediate differences in treatment outcome, but some indication of positive effects in the six months follow-up period.

Keywords: dissociative disorders; treatment outcome; child abuse and neglect; group psychotherapy

Dissociative Identity Disorder (DID) is the most severe of the dissociative disorders described in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013). DID is characterized by having different dissociative identities, often referred to as parts or selves, with reported disruptions in memories, sense of self, and agency. Patients report dissociative amnesia, involving a lack of recall of autobiographical material both in daily-life and for traumatic events. DID and the closely related Other Specified Dissociative Disorders, example 1 (OSDD), where similar disturbances are observed without

meeting the full clinical picture of DID, are commonly categorized as Complex Dissociative Disorders (CDD; Dell, 2009). CDDs are among the most costly psychiatric conditions, both in terms of societal resources and individual suffering (Spiegel et al., 2013). Patients with CDD suffer from severe psychiatric symptoms, high level of comorbidity with other disorders, low level of psychosocial functioning, and frequent suicidality and self-destructive behavior (Bækkelund et al., 2018; Boon & Draijer, 1993; Foote et al., 2008; Mueller-Pfeiffer et al., 2012; Rodewald et al., 2011). Studies indicate that the prevalence of DID in psychiatric populations might be as high as 5 % (Sar, 2011).

CDD is commonly associated with early traumatization and patients predominantly report being victims of childhood abuse, especially sexual abuse (Bækkelund et al., 2018; Dalenberg et al., 2012). However, the causal role of trauma in the development of dissociation is a source of controversy, with two competing models for the etiology of the disorder. The Trauma-model (TM) views dissociation as a response to severe trauma that allows the individual to cope with distress in the immediate aftermath but may lead to the development of dissociative disorders later (Dalenberg et al., 2012). This transition is especially likely if the trauma is prolonged, impacts at vulnerable stages of a child's development, and involves elements of secrecy, shame, or betrayal by caregivers as typically present in childhood sexual abuse. The personality disruptions and amnesia characteristic of DID are generally understood as the individual's effort to defend against or *compartmentalize* memories, feelings, and sensations related to trauma (Brown, 2006). However, several independent theories embedded in the TM propose different psychological mechanisms involved in the disorder (Dell, 2006a; Frewen & Lanius, 2014; Nijenhuis & van der Hart, 2011).

The opposing Sociocognitive model (SCM), sometimes referred to as the Fantasy Model, contends that psychological factors such as fantasy proneness and suggestibility, together with outside influences from cultural expressions (films, books, internet fora, etc.) or suggestive therapeutic practices, cause dissociation and dissociative disorders. Proponents of this perspective do not completely deny that trauma has a role in the development of CDDs, but view traumatization as one of many factors that may leave an individual vulnerable to suggestive influences. These influences can convince the person to explain experienced psychological distress in terms of multiple personalities and cue the creation of false memories of abuse and trauma. CDD are in this perspective not viewed as a genuine psychiatric condition, but a result of *iatrogenic* therapeutic mistreatment and cultural superstitions. Accordingly, proponents of SCM have warned about the potentially harmful effects related to the treatment of CDD, since treatment may reinforce beliefs about multiple personalities and trauma through suggestive influences (Lilienfeld, 2007; Lynn et al., 2012; Paris, 2012), although no empirical evidence has been presented that support this assertion (Loewenstein, 2018).

At present, no evidence-based guidelines for the treatment of DID exist and very few clinical-studies on this patient group have been published. Practice-based guidelines developed by the International Society for the Study of Trauma and Dissociation (ISSTD, 2011) recommend a phased-based approach, with three stages. The first *stabilization* phase is focused on establishing safety, increasing control over symptoms, and improving psychosocial functioning. When the patient is sufficiently stabilized, treatment may progress to the second phase where traumatic memories are confronted and processed. A central premise of the recommendations is that premature trauma-processing in patients with CDD, without sufficient stabilization, can lead to symptom exacerbation and deterioration in functioning (Brand et al.,

2014). The final third phase of treatment addresses rehabilitation and reintegration of personality states. Throughout treatment, the guidelines recommend interventions that explicitly address dissociation, including identifying and addressing different self-states or parts of the personality (ISSTD, 2011). This is thought to help the patient to improve inner communication and cooperation between parts of the personality, and thereby improve control and functioning.

A review from 2009 identified eight studies on the treatment of dissociative disorders, all non-randomized and without a control group (Brand et al., 2009). Overall, treatment was associated with a reduction in both dissociative and other symptoms from pre- to post-treatment, with medium to large effect sizes. In a later naturalistic study of inpatient treatment of patients with sexual abuse histories, (Jepsen et al., 2014) reported moderately effects of treatment on PTSD symptoms and general symptomatology in 24 patients with CDD from assessment to follow-up. However, changes in dissociative symptoms were insignificant and treatment gains were generally lower than in patients without CDD. Also, Brand and colleagues (Brand et al., 2009; 2013; Myrick, Webermann, Loewenstein, et al., 2017) followed the outpatient treatment of 226 patients with CDD, recruited through their therapist, in a longitudinal observational study. Treatment was associated with a decrease in symptomatic distress (dissociation, PTSD symptoms, and general psychopathology), reduction of self-destructive behavior (self-harm, substance abuse, and hospitalizations), and improvement in psychosocial functioning. These gains were maintained at six-year follow-up and associated with economic cost-savings (Myrick, Webermann, Langeland, et al., 2017; Myrick, Webermann, Loewenstein, et al., 2017). However, the participating patients had been in treatment for an average of five years with their current therapist, and a substantial number were still in treatment six years later, showing the substantial

therapeutic effort required to achieve these gains. Also, treatment in this study was not protocolled, although a majority of therapists proclaimed to use interventions recommended by ISSTD guidelines (Myrick et al., 2015). The only clinical study to date using a standardized intervention investigated the safety and effects of a web-based education program focused on stability and safety (Brand et al., 2019). In an internationally recruited sample of 111 patients with CDD, the online intervention completed together with regular individual therapy was associated with decreases in dissociation, PTSD symptoms, and self-destructive behavior, while emotion regulation and adaptive capacities improved. Treatment gains increased over a two-year period and were larger in patients with high initial dissociation scores. As with all previous studies though there was no control group and since patients were recruited through interested therapists the generalizability of the results might be limited by selection bias.

Although previous studies indicate that patients' CDD can improve while receiving psychotherapy, there is a clear need for more methodologically rigorous studies to make more solid inferences about treatment. Most notably, randomized allocation and inclusion of a control group make causal inferences about treatment efficacy possible. Structured and protocolled treatments, based on specific psychological theories, will allow replication and inform the therapist about interventions associated with progress. Also, participant inclusion should be less restricted and based on normal clinical requirements, to decrease selection-bias and ensure generalizability to ordinary clinical settings.

The current study therefore aims to evaluate a structured protocolled group-treatment delivered in a naturalistic clinical setting to patients with CDD, as an add-on to individual treatment. The study also included a control condition of ordinary individual treatment. We predicted that treatment would lead to overall improvements in psychosocial functioning and a

reduction in psychiatric symptoms. We also predicted that participation in group-treatment combined with individual treatment would lead to greater improvements compared to individual treatment alone.

Methods

Setting and participants

The current study was conducted at an outpatient clinic that accepts referrals of patients with reported trauma histories and trauma-related difficulties. The clinic primarily offers specialized group treatment, and patients are required to have planned or ongoing individual treatment at another clinic or private practice to be admitted. Recruitment of patients started in September 2014 and ended in November 2017. All referred patients were invited to participate at intake and written informed consent was obtained. Further inclusion or exclusion was based on the following structured diagnostic interviews. Inclusion and exclusion criteria were the same as those used by the clinics' treatment program for dissociative disorders. All included patients had to: (1) meet criteria for a diagnosis of Dissociative Identity Disorder or Other Specified Dissociative Disorders, example 1; (2) be between 18 and 65 years of age; (3) have sufficient competence in Norwegian to be able to participate in a psychoeducational group. Exclusion criteria were: (1) acute suicidality; (2) severe substance abuse interfering with treatment; (3) ongoing psychotic episode; (4) current life – crisis interfering with therapy (e.g. ongoing abuse, divorce, court case, a somatic disease in spouse or children, etc.); (5) neurological disease, mental disability or life-threatening somatic disease. More information about recruitment and patient-flow is outlined in figure 1.

The study was funded by Modum Bad Psychiatric Hospital. All procedures comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. The study was approved by the Norwegian Regional Committees for Medical and Health Research Ethics (2013/2350).

(Figure 1)

Design and randomization

As previously described this study recruited participants from referred patients to an ordinary clinical service, and a no-treatment control group was therefore difficult and unethical to employ. We therefore chose a delayed-treatment design, where included patients were randomized to either the group intervention immediately (EXP) or after a corresponding waiting period (CTR). All participants continued with their conventional individual treatment throughout the study period, including the waiting period for the CTR group. With this design, all patients receive the intervention, and the mean waiting time from ordinary clinical practice was not prolonged. A delayed-treatment design also allows for both a “true experiment” comparing the intervention with a control group and a switching replication when the control group later receives the intervention (figure 2). To investigate long-term effects we also assessed participants six-months after the end of the intervention.

(Figure 2)

Following assessment and inclusion, participants were randomized to conditions by an independent administrative assistant not involved in the research group. Random sequences were

generated at www.graphpad.com. Researchers and assessors involved in the study were not informed about condition assignment, to ensure blind assessment of outcome measures. The protocol originally planned to include 72 participants (36 in each condition), based on a priori power analysis. However, due to a lower prevalence of CDD in the study population than predicted and resource constraints, the final sample recruited was 59 participants. The trial was preregistered at Clinical Trials (NCT02450617).

Treatment

The experimental treatment studied consisted of twenty 90-minutes sessions of psychoeducational group therapy, offered adjunct to the participants' conventional individual treatment. The treatment was based on the published manual *Coping with Trauma-Related Dissociation* (Boon, Steele, & Hart, 2011). This manual relies on a theoretical understanding of dissociation and dissociative disorders rooted in the theory of structural dissociation (Hart et al., 2006; Nijenhuis & van der Hart, 2011), defining dissociation as a core feature of trauma that involves a division of the personality into distinct dissociative parts. This division manifests in the severe psychoform and somatoform dissociative symptoms in CDD. The treatment teaches understanding of different dissociative parts and skills to facilitate *inner cooperation* between parts. The treatment also draws upon different therapeutic orientations such as cognitive-behavioral therapy, mindfulness and short-term dynamic therapy. The focus of the manual is on the first stabilization phase of treatment (ISSTD, 2011). Each of the 43 chapters consist of educational pieces to foster the participants understanding of their disorder and instructions for coping-skills and homework. For the experimental intervention, the first author of the manual (SB) selected topics for 20 sessions. The themes of these chapters can be seen in table 1. As

outlined by the manuals *guide for trainers*, each group were led by two therapists and had nine participants. To enhance each participant's feeling of safety and predictability all sessions were highly structured, with psychoeducation, structured group-discussion and skills-exercises. In addition, participants had access to written material, and video-recordings of educational pieces and exercise-instructions.

(Table 1)

The conventional individual treatment of each patient was delivered as seen fit by their individual therapists, while psychometric information was collected through the data collection. Individual therapists were psychologists, psychiatrists, or nurses working in other clinical departments or private practice (see supplementary). All individual therapists were informed about the results of the diagnostic assessment. They were invited to a meeting at the start of the group and informed about the rationale and content of the intervention. While in group-treatment, patients were encouraged to discuss their experiences from the group, discuss homework, and share written material with their individual therapists.

Measures

Diagnostic assessment

The Structured Clinical Interview for DSM-IV Dissociative Disorders (Steinberg et al., 1993) was used to assess dissociative disorders. SCID-D assess five dimensions of dissociative symptoms (amnesia, depersonalization, derealization, identity confusion, and identity alteration) on a four-point scale (1= 'none', 2= 'mild', 3= 'moderate', 4= 'severe'), based on the patient's

descriptions and observations during the interview. The information and scoring obtained during the interview were used to diagnose patients based on DSM-5 criteria. All diagnostic evaluations were done jointly by clinicians with extensive training and experience in diagnosing dissociative disorders.

The Multidimensional Inventory of Dissociation (Dell, 2006b) is a self-report measure with 218 items that uses an 11-point Likert scale. Of these items, 168 measure different dimensions of dissociation, while 50 measure validity. In the present study, MID scores were used primarily as supplementary information towards a diagnostic decision on CDD status.

The Post-traumatic Symptom Scale - Interview (PSS-I; Foa et al., 1993) was used to assess PTSD. PSS-I has shown good interrater reliability and convergent validity with other measures of PTSD (Foa & Tolin, 2000).

The Mini-International Neuropsychiatric Interview (Sheehan et al., 1998) was administered to assess general psychopathology.

Childhood Trauma Questionnaire – Short form (Bernstein et al., 1994; Dovran et al., 2013) was used for self-reported childhood trauma history. CTQ-SF has 28 items scored from 0 (“never true”) to 5 (“very often true”) and has five subscales: Emotional neglect, physical neglect, emotional abuse, sexual abuse, and physical abuse.

To record background information and sociodemographic data we used a generic form.

Outcome measures

Observer-based

Global Assessment of Functioning – Split version (GAF-S; Karterud, Pedersen, Loevdahl, & Friis, 1998) was used to assess psychosocial functioning. GAF-S consists of two subscales that score global psychosocial functioning and severity of symptoms, each scored between 1 and 100, representing low to high functioning last 7 days. These scores were obtained based on semistructured interviews conducted by blind raters. Raters had previously completed a web-based feedback training program for GAF-S scoring, shown to strengthen reliability and validity (Støre-Valen et al., 2015). We also employed a procedure shown to further strengthen reliability (Pedersen et al., 2007) where relevant information from each interview was also conveyed to a second blind rater who gave an independent score, with the mean score of both raters determining the final score.

Self-report

PTSD Symptom Scale - Self-Report (PSS-SR; Foa et al., 1993) assess the severity of PTSD symptoms with 17 self-report items, measuring three symptom dimensions (reexperiences, avoidance, and hyperarousal) Each item is scored, based on frequency and severity of the symptom, on a Likert scale from 0 (not at all or only one time) to 3 (almost always or five or more times a week). PSS-SR has shown satisfactory sensitivity, reliability, internal consistency, and validity. A cut-off score of 14 indicates clinically significant PTSD-symptoms (Coffey, Gudmundsdottir, Beck, Palyo, & Miller, 2006)

Symptom Checklist 90 Revised (SCL- 90 R; Derogatis, 1994) is a widely used self-report measure of 90 items for psychological symptoms and distress. The summary score referred to as the Global Severity Index (GSI) was used as a measure of general symptom level.

Inventory of Interpersonal Problems (Horowitz, Alden, Wiggins, & Pincus, 2000) self-report measure to assess interpersonal difficulties with 64 items rated from 0 (not at all) to 4 (very much). The mean score across all items was used as a general measure of interpersonal difficulties.

Dissociative Experiences Scale (Bernstein & Putnam, 1986) is a 28-item self-report questionnaire designed to measure both pathological and non-pathological dissociative experiences. It uses an 11-point Likert, asking respondents to indicate the percentage of their time these experiences affect them. The mean of all items was used in this study.

All self-report based measures were collected via a secure web-based platform (www.checkware.no) in ordinary use at the hospital. Participants were provided with instructions and access-code and could choose to submit their responses at the clinic or in private. Regular reminders were sent to participants that had not completed the measures.

Statistical Analyses

Demographics, clinical characteristics, and individual treatment- data were analyzed for group-differences at pre-treatment with t-tests for continuous variables and chi-square test for categorical data. Non-parametric tests were used if assumptions of normality were not met.

For outcome measures, we first calculated within-group pre-post effect-sizes based on Cohen's d

(Cohen, 1977) using the formula
$$d = \frac{|m_1 - m_2|}{\sqrt{S_1^2 + S_2^2 - (2rS_1S_2)}}$$

Pre-post scores for each condition were analyzed with paired sampled t-tests.

Differences in outcome-trajectories between conditions were further analyzed with multilevel mixed-models (MLM) performed with the MIXED procedure in SPSS version 26. This analytical approach accommodates dependencies in nested observations, for instance in hierarchical data-structures or longitudinal measurements of the same person. To test the hypotheses three different MLM's were built:

The first model was built by testing a series of models for model fit, using Akaike Information Criteria (AIC) and -2 log likelihood. The models were built by adding a fixed effect of intercept and time, and random effects of intercept and time, and different covariance structures. When the best model was decided on, the treatment condition was added as a predictor, to test a condition x time interaction. The time variable was centered at the switching point, with negative values prior and positive values after the switching point. This model tested if the model implied intercept and the linear slope across all measurement points was different across the two treatment conditions.

The second model was a continuation of model 1 but was fitted with a linear-spline model with a knot at the switching point. This procedure breaks the time-variable into two linear functions, allowing for condition x time interactions to be tested for different time-periods. The first linear function corresponds to the true experiment (see figure x) and is a direct test of the effect of the group treatment versus the delayed treatment condition. The second linear function refers to the switching replication and is a test of the group treatment versus the follow-up condition. The intercept is a test of the difference across the conditions at the switching point.

The third model was also a continuation of the first model. This model retained one linear slope but had an interrupted timeline. That is, the timeline was recoded so that the intercept was

moved to the end of the follow-up period for the EXP condition, whereas the intercept for the CTR condition remained at the switching point (i.e. at the end of the waiting list period).

Accordingly, the estimation of the intercept is a test of the difference between the groups when the EXP condition had completed both the group therapy and subsequent individual therapy, whereas the CTR condition had not yet started the group therapy, but had received individual therapy from their individual therapists.

Results

Sample characteristics and threats to validity

Sample characteristics and differences between conditions are outlined in table 2 and table 3. As expected based on previous studies, participants reported a high degree of childhood trauma, including sexual abuse. They also filled criteria for several other psychiatric conditions and the large majority reported previous inpatient treatment. Despite an average of 15 years since the first contact with mental health services, less than half of participants reported previously being diagnosed with a dissociative disorder prior to participation in this study.

(Table 2)

We observed no statistically significant differences between the treatment conditions on background variables or outcome variables at baseline, indicating that the randomization procedure had produced similar samples. There were similarly no significant differences in frequency of individual sessions or therapeutic alliance between the two conditions.

(Table 3)

Attrition and missing data handling

As reported in Figure 1, 14 patients (23%) dropped out during the study period. In both conditions drop-out was higher in the period when patients received group-treatment. The only significant difference between dropouts and completers on background and baseline variables was significantly higher mean MID scores in dropouts (50.9 vs. 35.8). Rates of missing data was highest for self-reported outcomes at the follow-up timepoints, with up to 41% missing values. As previously described, we used maximum likelihood estimation in the mixed models that handles missing values under the assumption of missing at random (MAR). In addition we employed multiple imputations to obtain unbiased estimates of means, standard deviations, and effect sizes. Twenty datasets for outcome measures, with background variables and pre-treatment scores as predictors, were generated and pooled estimates were used to calculate means, standard deviations, and effect sizes.

Outcomes

Outcome measures for each timepoint in both conditions can be seen in table 4. We observed significant improvements in psychosocial functioning in both conditions across treatment, with medium to large effect-sizes. There was also a significant reduction in PTSD scores and general psychopathology in the control-condition with medium effect-sizes, primarily related to symptom reductions during the follow up phase. Other outcome-measures did not show significant changes from pre-treatment to follow-up.

(Table 4)

Mixed models

Preliminary analysis: The model that provided the best model fit was estimated with a fixed effect of intercept and time, and random effects of intercept and time. Estimates for all models can be seen in table 5.

Model 1: The model estimated effect of intercept was significant (wiz. at the switching point, $t = 40.5$, $p < .001$), but the effect of condition on the intercept was not significant ($t = 1.4$, $p = .16$), indicating that the GAF-score at the intercept was significantly larger than zero, but not different between the conditions. The effect of time was significant ($t = 2.6$, $p < .05$), but the interaction between time and condition was not significant ($t = 1.6$, $p = .12$), meaning that the model estimated that the patients improved from the start of therapy to the end of follow-up, but that the two groups did not differ in their development over time (see also Table 4).

Model 2: The model estimated effect of intercept was significant (wiz. at the switching point, $t = 32.6$, $p < .001$), but the effect of condition on the intercept was not significant ($t = 0.6$, $p = .56$). Neither the first timeline (wiz. true experiment, $t = 1.0$, $p = .32$) nor the interaction between the first timeline and condition was significant ($t = 0.01$, $p = .92$). However, the second timeline was significant (wiz. the switching replication, $t = 2.2$, $p < .05$) as was the interaction between timeline and condition ($t = 2.5$, $p < .05$). That is, the model indicated that there was no significant change in GAF during the true experiment, and the conditions did not differ in their development. However, in the switching replication, there was both a significant change, and a significant effect of condition where the EXP condition had significantly larger change than the CTR condition.

Model 3: The model estimated effect of intercept was significant (wiz. at the end of follow-up for the EXP condition and the switching point for the CTR condition, $t = 39.6$,

$p < .001$), and the effect of condition on the intercept was significant, with the EXT condition having higher scores on GAF ($t = 3.2$, $p < .01$). That is, the model implies that when the EXP group has completed the follow-up period they have significantly higher scores on GAF than the CTR condition when they have completed the waiting period, with a large effect size (0.73). The timeline across all measurement points was also significant ($t = 2.8$, $p < .01$), but the interaction between time and condition was not significant ($t = 1.7$, $p = .08$).

(Table 5)

Discussion

The aim of this study was to evaluate the treatment of patients with CDD that combined individual treatment with psychoeducational group-based stabilization – treatment. As predicted, we observed overall improvements in psychosocial functioning, as measured with GAF, with large pre-post effect sizes. Self-reported symptoms and self-destructive behavior remained mostly unchanged, with only a small decrease in PTSD and general psychiatric symptoms in the control condition being significant. We did not observe differences in treatment-trajectories consistent with our second prediction that group-treatment would lead to greater improvements than individual treatment alone since trajectories were parallel before the switching point. This indicates that the studied stabilization treatment does not immediately produce superior outcomes compared to individual treatment alone.

We did however find indications that the effects of group treatment on psychosocial functioning were more profound in the follow-up period, with differences in intercepts indicating a between-group effect of medium size. Similarly, we found that the significant improvements in self-reported symptoms in the control condition occurred in the period following group-

participation. These findings should be interpreted with caution, as our delayed-treatment design did not allow for a direct comparison of follow-up effects and the control condition but nevertheless may point to a possible positive long-term effect of the study-treatment. This is in line with the rationale for stabilizing treatment for dissociative disorders. Boon and colleagues (2011) describe that the stabilizing groups « (...) *highlights ways for both the dissociative patient and the therapist to effectively work with an underlying dissociative organization of the personality as an essential part of coping with many of the well-known symptoms of chronic traumatization* ». ISSTD guidelines also describe skills training as an essential part of stabilization (ISSTD, 2011). Understandably, the effect of newly acquired skills and improved mutual understanding of dissociative processes for patients and therapists will be more prolonged rather than immediate. Clinical experience indicates that many patients require a longer time to process the material and learn to manage dissociation and other symptoms. It is also important to underline that the study treatment was an abbreviated 20 session version of the 43 session treatment outlined by Boon and colleagues (2011), so a longer intervention might have improved outcomes.

The observed improvements in psychosocial functioning suggest that participants in the current study improved as expected in the first stabilization - phase of treatment. An earlier naturalistic study (Brand et al., 2009) can serve as a comparison since GAF scores of CDD patients were reported from cohorts in different phases of treatment, as defined by ISSTD guidelines. The scores of the phase 1 cohort ($M = 44.7$) were higher than pre-treatment GAF scores in the current study ($M = 41.3$), while the phase 2 cohort scores ($M = 48.7$) were comparable to the post-treatment scores ($M = 47.5$). Accordingly, patients in our study had poorer initial psychosocial functioning but were brought significantly towards the next phase of

treatment more quickly than in the naturalistic sample, where patients in the second phase had been in treatment for a mean of 4.1 years (Brand et al., 2009).

As with previous empirical investigations of treatment of CDD (Brand et al., 2009, 2014), the results from the current study do not support the Sociocognitive model of dissociation and the auxiliary iatrogenic hypothesis of treatment. According to several proponents of this theory (Lilienfeld, 2007; Lynn et al., 2012; Paris, 2012), interventions focused on dissociative parts will reinforce the patient's incorrect beliefs about having multiple identities and false memories of abuse. Thus, they claim that such treatment can worsen symptoms and functioning and cause harm to patients, although to our knowledge no empirical confirmation of these fears has been presented (Brand et al., 2014). For the first time in a randomized controlled design, we show that treatment following expert guidelines (ISSTD, 2011) rather is associated with improvements in psychosocial function and no significant deterioration or harm to patients.

However, it is important to acknowledge that the clinical effects of this study on self-reported symptoms were either small or insignificant. Despite improvements in psychosocial functioning, most of the participants still experienced high degrees of suffering and disturbances. Most noteworthy, little changes in dissociative symptoms as measured with DES and SDQ occurred, indicating that the treatment failed to facilitate change in the core features of the disorders. The phase-based model that forms the basis of ISSTD guidelines (ISSTD, 2011) and the study-treatment has been challenged recently, both as it applies for treatment of PTSD (De Jongh et al., 2016) and CDD (Huntjens et al., 2019b). Critics argue that trauma-focused treatment without a preceding stabilization-phase may be more effective. Evidence-based treatments for other psychiatric disorders have also been suggested as potentially effective for CDD (Huntjens et al., 2019a; Mohajerin et al., 2020). Our results highlight that there is much

room for improvement in the treatment of patients suffering from CDD and the importance of continued innovation in interventions and treatment delivery. Together with methodologically sound clinical research, this may improve options for patients and clinicians. In addition, qualitative research can inform how patients with CDD experience treatment and what outcomes they view as most important for them (Stadtman et al., 2018). Qualitative interviews have been conducted with a subsample of this trial that will be analyzed and presented in the future.

Several limitations to our study are important when interpreting the results. First, the sample of the study is small and we were not able to recruit as many participants as originally planned. Together with attrition, this reduced the statistical power to detect statistically significant effects and thereby increased our type II error rate. Also, we experienced a large proportion of missing data, especially in self-reported measures, that weakens the confidence of our estimates. We did not control or protocol individual therapies. Although we collected data on content and frequency, other possible confounding variables might have affected differences between conditions. As previously mentioned, the delayed treatment design that was employed made it difficult to infer differences after the follow-up period. The group assessments and group interventions were conducted by well trained and experienced clinicians, but we did not test interrater reliability or collect observer-based data on fidelity. And finally, we did not control for medication use.

However, this study is to our knowledge the first clinical study of treatment of CDD that includes a randomized design and a control condition. Other strengths are that the inclusion of participants was based on ordinary clinical referrals and transparent criteria of inclusion and exclusion, strengthening the generalizability of our results. Since the study-treatment was

protocolled and based on a published treatment - manual, the results can more easily influence clinical practice and make replication studies possible.

Conclusion

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Figure 1. Flow-diagram of randomized controlled trial of group treatment for complex dissociative disorders **Figure 2. Illustration of study-design combining a randomized trial with delayed treatment control group and multiple time series with switching replication**

Note: EXP (Filled lines) = Experimental treatment; CTR (stapled lines) = Control treatment

Table 1. Psychoeducational topics in group program for complex dissociative disorders, based on *Coping with Trauma-Related Dissociation* (Boon et al., 2011)

Session	Topic	Chapter in manual
1	Introduction. Rules, regulations, and motivation	
2	Learning to regulate yourself (1)	18
3	Understanding dissociation	1
4	Symptoms of dissociation	2
5	Understanding dissociative parts of the personality (1)	3
6	Understanding dissociative parts of the personality (2)	3
7	Overcoming phobia of inner experience	5
8	Learning to reflect	6
9	Beginning to work with dissociative parts	7
10	Developing an inner sense of safety	8
11	Summary and review of content so far	
12	Establishing a healthy daily structure	10
13	Improving sleep	9
14	Understanding traumatic memories and triggers	14
15	Coping with triggers (1)	15
16	Learning to regulate yourself (2)	18
17	Inner cooperation	27
18	Planning for difficult times	16
19	Preparing for saying goodbye	35
20	Evaluation and leave-taking	

Table 2 Sample and group characteristics

Characteristic	Total (59)	EXP (29)	CTR (30)	Sample diff.
Demographics				
Age	35.2 (11.3)	34.7 (12.0)	35.6 (10.6)	$U = 390, p = 0.49$
Female sex	93.2 %	96.7 %	89.7 %	$\chi^2 = 1.15, p = .28$
Married or partner	55.1 %	59.1 %	51.9 %	$\chi^2 = 0.25, p = .61$
College-level education	43.8 %	50.0 %	38.5 %	$\chi^2 = 0.64, p = .42$
Living with children	35.4 %	40.9 %	30.8 %	$\chi^2 = 0.53, p = .46$
Occupational status				
Work incapacity	81.3 %	81.8 %	80.8 %	$\chi^2 = 0.01, p = .92$
Student, full or part time	6.3 %	9.1 %	3.8 %	$\chi^2 = 0.56, p = .45$
Employed, full- or part-time	35.4 %	36.4 %	34.6 %	$\chi^2 = 0.01, p = .90$
Treatment history				
Years since first contact with mental health services	15.2 (10.7)	14.4 (10.2)	16.2 (11.5)	$U = 230, p = .55$
Inpatient treatment ever	73.8 %	77.8 %	70.8 %	$\chi^2 = 0.26, p = 0.61$
Inpatient treatment last year	34.1 %	27.8 %	39.1 %	$\chi^2 = 0.26, p = 0.61$
Previous diagnosed dissociative disorder	43.5 %	52.4 %	36.0 %	$\chi^2 = 1.25, p = 0.26$

Note: Data presented as means (SD) or percentages. EXP = Experimental group; CTR= Control group; U = Mann-Whitney U statistic; χ^2 = Chi Square Value

Table 3. Sample trauma-history and clinical comorbidity.

	Total (59)	EXP (29)	CTR (30)	Diff. conditions
MINI Number of comorbid axis-I disorders	6.3 (2.6)	6.2(2.6)	6.5(2.7)	$t(52) = 0.38, p = .71$
MINI any depressive disorder (present or lifetime)	90.7 %	88.5 %	92.9 %	$\chi^2 = 0.31, p = .58$
MINI any bipolar disorder (present or lifetime)	1.9 %	0	3.6 %	$\chi^2 = 0.95, p = .33$
MINI severe suicidality (scored above 2)	33.3 %	30.8 %	35.7 %	$\chi^2 = 0.15, p = .70$
MINI any anxiety disorder (present or lifetime)	90.7 %	92.3 %	89.3 %	$\chi^2 = 0.15, p = .70$
MINI substance abuse	11.1 %	15.4 %	7.1 %	$\chi^2 = 0.93, p = .34$
MINI any psychotic disorder (present or lifetime)	33.3 %	26.9 %	39.3 %	$\chi^2 = 0.93, p = .34$
MINI any eating disorder	14.8 %	11.5 %	17.9 %	$\chi^2 = 0.43, p = .51$
MID total	41.5 (17.2)	39.5 (17.9)	43.2 (16.7)	$U(50) = 276, p = .28$
CTQ total	76.1(19.0)	76.8(20.1)	75.4(18.3)	$t(50) = -0.26, p = .78$
CTQ – Emotional abuse	94.2 %	92.0 %	96.3 %	$\chi^2 = 0.44, p = .51$
CTQ – Physical abuse	65.4 %	64.0 %	66.7 %	$\chi^2 = 0.04, p = .84$
CTQ – Sexual abuse	82.7 %	80.0 %	85.2 %	$\chi^2 = 0.24, p = .62$
CTQ – Emotional neglect	78.8 %	84.0 %	74.1 %	$\chi^2 = 0.77, p = .38$
CTQ – Physical neglect	84.6 %	92.0 %	77.8 %	$\chi^2 = 2.02, p = .16$
Number of CTQ abuse types	4.1 (1.2)	4.1 (1.1)	4.0 (1.2)	$U(50) = 324, p = .79$

Notes: Data presented as percentages or means (standard deviation). EXP = Experimental group; CTR= Control group; U = Mann-Whitney U statistic; χ^2 = Chi Square Value; MID = Multidimensional Inventory of Dissociation; CTQ = Childhood Trauma Questionnaire.

Table 4. Mean, Standard deviation, and effect sizes from assessment to follow-up

Measure and allocation	Assessment	T1 Pre treatment	T2 Switching - point	T3 Switching replication	T4 Follow up CTR	Effect size (d) pre – follow up
GAF						
EXP		41.7 (5.7)	43.9 (6.3)	48.4 (6.3)		0.87**
CTR		40.9 (8.2)	44.2 (8.7)	45.7 (4.2)	46.6 (6.7)	0.65**
PSS-SR						
EXP	32.9 (6.3)	33.3 (5.5)	33.2(6.5)	33.3 (6.9)		0.03
CTR	34.6 (8.3)	34.6 (7.3)	36.5 (6.4)	34.5 (5.9)	29.5 (7.9)	0.50**
DES						
EXP	34.6 (29.8)	36.5 (15.9)	38.2 (16.1)	36.0 (16.6)		0.05
CTR	41.9 (21.2)	47.8 (18.6)	45.4 (13.6)	40.8 (13.6)	37.9 (11.5)	0.12
SCL90						
EXP	1.8 (0.9)	1.8 (0.7)	1.7 (0.8)	1.7 (0.9)		0.13
CTR	1.9 (0.7)	1.9 (0.9)	1.9 (0.9)	1.9 (1.0)	1.6 (0.8)	0.39*
IIP						
EXP	1.7 (0.6)	1.8 (0.1)	1.7 (0.6)	1.7 (0.6)		0
CTR	1.7 (0.5)	1.7 (0.7)	1.7 (0.5)	1.6 (0.8)	1.4 (0.7)	0.35

Note: Data displayed as mean (std. deviation). * $p < 0.05$, ** $p < 0.01$; GAF = Global Assessment of Functioning; PSS-SR = PTSD Symptom Scale Self Report; DES = Dissociative Experiences Scale; IIP 64 = Inventory of Interpersonal Problems 64; SCL 90 = Symptom Checklist 90.

Table 5. Multilevel mixed-models with GAF as dependent variable

Model		Parameters/Outcomes			
		<u>Fixed parameters</u>		<u>Random parameters</u>	
1	Linear Model	Intercept	42.6**(1.1)[40.5 – 44.7]	Intercept	19.5**(5.7)
		Randomization	2.1 (1.5) [-0.9 – 5.1]	Time	5.2**(3.3)
		Time	1.8* (0.7)[0.4 – 3.2]		
		Time *randomization	1.7 (1.1) [-0.5 – 3.9]		
				<u>Model fit</u>	
				AIC	1008.1
				-2 Log RL	1000.1
		<u>Fixed parameters</u>		<u>Random parameters</u>	
2	Spline Model	Intercept	42.6** (1.3)[39.9 – 45.2]	Intercept	29.1**(8.8)
		Randomization	1.1 (1.9)[-2.6 – 4.8]	Time1	52.0* (16.7)
		Time 1	1.8 (1.8)[-1.8 – 5.4]	Time 2	6.2 (4.5)
		Time 2	1.8* (0.8)[-0.1 – 3.4]		
		Time1 *randomization	0.2 (2.5) [-4.8 – 5.2]		
		Time2 * randomization	3.5* (1.4)[0.7 – 6.3]		
				<u>Model fit</u>	
				AIC	992.4
				-2 Log RL	978.4
		<u>Fixed parameters</u>		<u>Random parameters</u>	
2	Interrupted time	Intercept	42.6** (1.1)[40.5 – 44.7]	Intercept	19.90**(6.5)
		Randomization	5.6* (1.7)[2.2 – 9.1]	Time	2.0 (2.4)
		Time	1.8* (0.6)[0.4 – 3.0]		
		Time *randomization	1.8 (1.0)[-0.3 – 3.8]		
				<u>Model fit</u>	
				AIC	1010.7
				-2 Log RL	1002.7

Note. Standard error in parentheses, 95% Confidence Intervals in brackets. *p<0.05, **p<0.01. GAF = Global Assessment of Functioning

Supplementary, characteristics of conventional individual therapies

At each time-point, patients and individual therapists were asked to fill out a generic form asking about therapist background, characteristics of the therapy (length, frequency, working alliance) and to what degree the individual treatment was adapted in the period the patient attended stabilization group.

Characteristics of individual therapists

Gender	85,4 % Female
Age	20-30 years: 31-40 years: 39% 41-50 years: 39 % 51-60 years: 17,1 % 60 + years: 4,9%
Professional background	Doctor / Psychiatrist: 20,5% Clinical Psychologist: 74,4% Nurse: 2,6% Physical therapist: 2,6%
Work setting	Mental Health Clinic: 63,4% Private practice: 29,3% Inpatient hospital: 7,3%
Experience as therapist	0-5 years: 23,7% 6-10 years: 23,7% 11-15 years: 18,4% 16-20 years: 15,8% 21-30 years: 13,2% 31+ years: 5,3%
Training in trauma-treatment*	70%
Training in trauma-focused treatment**	37,5%
Previous experience as individual therapist for patient participating in stabilization group	32,5%
*Respondents indicated attending one or more courses or workshops about trauma-treatment ** Respondents indicated attending one or more courses or workshops about trauma-focused therapy, such as EMDR, Trauma focused CBT, Prolonged Exposure or Narrative Exposure Therapy	

Characteristics of individual therapies

Reported length of individual treatment at T1	< 1 month: 7,5% 1 – 3 months: 7,5% 3-6 months: 15% 6 – 12 months: 17,5% 1 – 2 years: 22,5% 2-4 years: 17,5% 4+ years: 12,5%
Number of individual sessions during participation in group therapy	< 5: 10% 5-10: 10% 11-15: 30% 16-20: 15% 21-25: 17,5% 26-30: 5% >30: 12,5%
Number of individual sessions during wait period (CTR)	< 5: 13% 5-10: 13% 11-15: 8,7% 16-20: 8,7% 21-25: 21,7% 26-30: 13% >30: 21,7%
Working Alliance Inventory (WAI) at T1	Therapist rated: Mean 4,7, SD 0,7 Patient rated: Mean 4,8, SD 1,3

Patient-reported adaptations of individual therapy in period corresponding to patient attending group treatment

I have talked about experiences from group treatment	Never: 0% Sometimes: 47,5% Often: 37,5% Very often/always: 15%
My therapist has asked about experiences from group treatment	Never: 5% Sometimes: 55% Often: 25% Very often/always: 15%
The topic of the psychoeducation in group has been a topic in the individual therapy	Never: 10% Sometimes: 50% Often: 25% Very often/always: 15%
We have reviewed the psychoeducation from group in the individual sessions	Never: 25,6% Sometimes: 43,6% Often: 20,5% Very often/always: 10,3%
My therapist has helped me with homework from group	Never: 53,8% Sometimes: 30,8% Often: 10,3% Very often/always: 5,1%
Exercises from group have been practiced in individual sessions	Never: 43,6% Sometimes: 38,5% Often: 12,8% Very often/always: 5,1%