Dispositional Resilience in Treatment-Seeking Patients with Obsessive-Compulsive Disorder and its Association with Treatment Outcome

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Abstract

There is a lack of research on the relation between Obsessive Compulsive Disorder (OCD) and resilience. Dispositional resilience, as described and defined in literature on hardiness, consists of three facets, namely beliefs about having *control* in everyday living, having a sense of purpose or *commitment,* and a positive attitude towards *challenges*. This study explores associations between dispositional resilience, symptom severity, and treatment outcome in a sample of 89 patients treated with concentrated exposure therapy (cET), and compares the findings with scores from two reference groups (students and soldiers). The patient group had significantly lower resilience scores than the two reference groups. Weak correlations were observed between dispositional resilience and OCD symptoms. Differences in dispositional resilience were weakly related to remission status at follow-up (odds ratio of 1.11). Furthermore, resilience improved from pre- to post-treatment (Cohen's *d* of 0.65). The main conclusion is that cET works well despite variations in patients' dispositional resilience scores.

Keywords: Obsessive-compulsive disorder, dispositional resilience, hardiness, concentrated treatment, predictor, treatment outcome.

Dispositional Resilience in Treatment-Seeking Patients with Obsessive-Compulsive Disorder and Its Association with Treatment Outcome

Obsessive-compulsive disorder (OCD) is a severe psychiatric disorder characterized by recurrent thoughts and images (obsessions) associated with anxiety and discomfort that the patient tries to minimize or control with repetitive behaviors or mental rituals (compulsions; American Psychiatric Association, 2013). The disorder tends to be chronic when untreated, and research suggests that quality of life is severely impaired by the illness (Eisen et al., 2006). About 50-70% of OCD patients can expect clinically significant change following cognitive behavioral therapy (CBT), including exposure with response prevention (ERP; Skapinakis et al., 2016; Öst, Havnen, Hansen, & Kvale, 2015; Öst, Riise, Wergeland, Hansen, & Kvale, 2016). Identifying predictors of treatment outcome is important in order to be able to provide better care for the remaining 30-50 % of patients. However, identifying consistent predictors of treatment outcome have proven difficult (Keeley, Storch, Merlo, & Geffken, 2008; Knopp, Knowles, Bee, Lovell, & Bower, 2013; Olatunji, Davis, Powers, & Smits, 2013).

Personal resources or resilience are believed to strongly influence psychopathology and coping (Zimmer-Gembeck & Skinner, 2016). One line of research investigating individual differences in resilience is on the hardiness trait. Kobasa (1979) identified distinctive feelings of *control,* as well as desirability of *challenge,* and sense of *commitment* in participants who handled stress well*,* and suggested these three facets as key components of hardiness, a construct intended to measure individual resiliency (here forth just referred to as resiliency). The control facet includes beliefs that the person is able to exercise control over their environment and pursue their own interests, as opposed to being controlled by external factors. The challenge facet consists of an understanding that changes in the environment are to be expected, and a source to growth and development as opposed to a threat that one should

avoid. Finally, the commitment facet has been described as a propensity to engage oneself in the things one does and having a sense of purpose (as opposed to feelings of alienation; Eschleman, Bowling, & Alarcon, 2010; Kobasa, 1979).

Control aspects have been proposed to be a core component of OCD. A review of control related beliefs in OCD by Moulding and Kyrios (2006) reported a negative relation between *sense of control*, i.e. the belief that one's action matters for outcomes in the real world, and OCD-symptoms. Similarly, a study from 2007 found higher *desire of control* and lower s*ense of control* in individuals with higher levels of OCD-related beliefs and symptoms (Moulding & Kyrios, 2007), and the finding has also been extended to patients with a clinical diagnosis of OCD (Moulding, Doron, Kyrios & Nedeljkovic, 2008). Hence, it could be relevant to explore whether sense of control (i.e. the control facet in resilience) is related to treatment outcome for OCD-patients.

Intolerance of uncertainty has been proposed to be another core component of OCD (Tolin, Abramowitz, Brigidi, & Foa, 2003), and OCD patients have been found to report lower scores on novelty seeking than controls (Kusunoki et al., 2000). Grayson (2010) claims intolerance of uncertainty must be understood and targeted by clinicians in order to succeed with ERP-treatment for OCD. Kashdan and Silvia (2009) argue that curiosity and novelty-seeking should be included in studies of psychological disorders, as "people suffering from psychological disorders, intrusive thoughts and anhedonic processes can blunt the experience and expression of appetitive activity" (p. 371). Evidence based psychological treatments for OCD require the patient to face uncertainty by approaching anxiety- and discomfort eliciting triggers and at the same time let go of the controlling rituals (Abramowitz, 1996). Consequently, it would be relevant to investigate preference for stability vs. challenges and change in OCD-patients (i.e. the challenge facet of resiliency), and its relation to treatment outcome.

Research has indicated a negative association between a sense of purpose/meaning and psychopathology or low psychological well-being (Harlow, Newcomb, & Bentler, 1986; Shek, 1992; Zika & Chamberlain, 1992). Having a sense of purpose in life has been related to better treatment outcome for alcohol and cocaine abuse (Martin, MacKinnon, Johnson, & Rohsenow, 2011; Waisberg & Porter, 1994). It has been suggested that intrinsic values or sense of purpose is important to motivate behavior and action towards desired outcomes (Wagner & Sanchez, 2002). To our knowledge, this relation has not been investigated for OCD. Hence, it might be relevant to investigate whether a sense of purpose (i.e. the commitment facet of resiliency) is important for symptom severity and treatment outcome in OCD.

As reviewed above, research on resilience and OCD could be important, but little research has been conducted on their relation. A comprehensive review from 2010 found that resiliency was positively related to social support, active coping and performance (Eschleman et al., 2010). They also reported a positive relation between resiliency and personality traits associated with good stress management (e.g. self-esteem, optimism and sense of coherence) and a negative relation with personality traits associated with worse stress coping (e.g. neuroticism, negative affectivity and trait anger; Eschleman et al., 2010). In addition, higher scores on the resiliency trait has been related to less health complaints (Johnsen, Hystad, Bartone, Laberg, & Eid, 2014) and better neuro-immunological response to stress (Sandvik et al., 2013). These aspects might also be relevant for OCD patients as they experience substantial amounts of stress and anxiety as discussed previously.

Two studies have examined the relation between OCD-symptoms and resiliency. However, both studies were conducted on non-clinical samples of youths (Hjemdal, Vogel, Solem, Hagen, & Stiles, 2011; Sun, Li, Buys, Storch, & Wang, 2014). Both studies found resiliency to be related to OCD symptoms. Hjemdal et al. (2011) reported overall resilience as

measured by the Resilience Scale for Adolescents (READ) to correlate negatively *(r = -.29)* with their measure of OCD (Obsessive– Compulsive Inventory-Revised) in Norwegian high school students. Sun et al. (2014) found achievement motivation, flexibility, self-esteem, and peer relationships to be related to obsessive-compulsive symptoms as measured with the Structured Clinical Interview for DSM-IV Axis I Disorders and the Maudsley Obsessive-Compulsive inventory (MOCI). None of the studies used the Yale–Brown Obsessive Compulsive Scale (Y-BOCS; Goodman et al., 1989a, 1989b), which is considered the gold standard for measuring OCD-symptoms. Further, both studies investigated resiliency in adolescent samples (average age was 14.7 years in the Chinese study and 16.4 years in the Norwegian study). We argue it is relevant to investigate resiliency in an adult sample diagnosed with OCD as a clinical sample probably experience more strain and stress than a non-clinical sample and, as reviewed above, resilience is tightly linked to stress management. Also, the relation between resilience and OCD might differ between adolecents and adults. Furthermore, the Norwegian study used the READ to measure resiliency, a questionnaire designed for youths. The Chinese study used the California Psychological inventory, measuring concepts *related to* resilience, but not a questionnaire developed specifically to measure individual resilience. Hence, there is a lack of studies investigating the relation between OCD-symptoms and resilience with a measurement specifically targeting individual resilience in the adult population.

There is also a lack of research on the relation between resilience and treatment outcome for OCD. Resiliency could be positively related to psychotherapy outcome. Studies have indicated a positive relation between multi-dimensional resilience scores and treatment outcome for pharmacological treatment of PTSD (Davidson et al., 2012) and depression (Camardese et al., 2007). Hence, it could be hypothesized that resiliency might be a transdiagnostic factor affecting course, severity or treatment outcome in psychiatric illnesses.

It is therefore also relevant to investigate whether resilience is related to treatment outcome for OCD patients.

In the current study we aimed to investigate a) Differences in resiliency scores between OCD patients and two reference groups (university students and soldiers); b) The relation between resiliency and OCD symptom severity in patients with OCD; c) The relation between resiliency and remission status at follow-up after completion of concentrated exposure therapy (cET); d) Changes in resiliency scores after completing cET. As OCD is characterized by rigid obsessions and compulsions, while resiliency is related to cognitive flexibility (Kosaba, 1979), we expected lower resiliency scores for the patients with OCD compared to the reference groups. Along the same lines, and considering previous findings in non-clinical populations (Hjemdal et al., 2011; Sun et al., 2014) we also expected a negative relation between symptom severity and resiliency. As common treatment (including cET) for OCD involves direct or imagined exposure to anxiety provoking objects or situations, patients scoring high on resiliency could view the challenges involved in treatment more positively and hence be more likely to engage in complete response prevention, and therefore benefit more from treatment. Research on resiliency and its relation to both symptom severity and treatment is important because it can help clinicians to individually tailor treatment and also guide future research on outcome predictors. To our knowledge, this is the first study to investigate dispositional resilience in a clinical population of OCD patients.

Methods

Participants and procedure

OCD sample: The OCD-team in Helse Bergen covers a catchment area of 420,000, and is one of 30 designed teams in Norway offering evidence-based psychological treatment for OCD (Kvale & Hansen, 2014). As part of a standard quality assurance procedure, OCD-patients referred to this clinic are routinely screened with symptom specific and treatment-

relevant instruments (consented by the Norwegian Data Protection Official (NSD/Personvernombudet), May 5th 2012). Data from these patients are subsequently stored in a clinical data registry. The current paper included patients from this registry whom fulfilled all of the following criteria: a) Completed the Bergen concentrated exposure treatment (cET; Hansen, Hagen, Öst, Solem & Kvale, 2018; Hansen, Havnen, Hagen, Öst & Kvale, 2018; Havnen et al., 2014, 2017). The Bergen 4-day OCD treatment delivered in a group setting: 12-month follow-up. *Frontiers in psychology*, *9*.); b) Had filled out the Dispositional Resilience Scale (DRS-15-R) pre-treatment; and c) Completed Yale–Brown Obsessive Compulsive Scale (Y-BOCS) interviews before treatment, after treatment, and at follow-up. A total of 44 group treatments were conducted between July 2012 and November 2016, and data was drawn from this sample. cET has been labelled "individual treatment in a group setting", since the treatment is delivered to groups of 3-6 patients by the same number of therapists. cET is administered over 4 consecutive days followed by three weeks of self-administered exposure tasks. During the 4 days, patients receive individually tailored and therapist assisted treatment in as many OCD-relevant settings as possible. Day 1 is reserved for psychoeducation and planning exposure tasks. Day 2 and 3 involves therapist-assisted exposure. Day 4 is assigned to discussing "lessons learnt" and agreeing on self-exposure tasks for the three weeks to follow. Since the ratio of therapists to patients is 1:1, cET facilitates close individual tailoring of the treatment for each patient while at the same time taking advantage of the group format where patients can learn from each other and give each other support. In order to be qualified as a therapist for the cET treatment, therapists have to undergo a thorough training, which consists of hands-on clinical training under supervision of experienced cET therapists and a multiple-choice exam. Exclusion criteria were non-fluency in Norwegian language, ongoing drug abuse, psychosis, and suicidal intention. In addition,

therapists recommended patients to discontinue any use of anxiolytics before initiating treatment.

The OCD-sample consisted of 89 patients (70.8 % female) with a principal diagnosis of OCD, as assessed by trained clinicians using the Mini International Neuropsychiatric Interview (Sheehan et al., 1998). Mean age for the OCD-sample was 31.69 ($SD = 10.65$). Most of the patients were full time workers ($n = 39$) or students ($n = 22$). Five were unemployed, nine were currently on sick leave, one was a pensioner, two lived of disability benefits, and 11 had other arrangements, such as part time jobs, homemakers, or sheltered workshops. Several patients had university or college degrees ($n = 39$), 34 had finished high school, six had finished primary school, and the rest did not provide information about their education. Thirty-three patients had one or more comorbid diagnoses, of which the most common were depression ($n = 12$), general anxiety disorder ($n = 12$), social phobia ($n = 6$), unspecified anxiety disorder ($n = 5$) and panic disorder ($n = 4$).

Military sample: A group of Norwegian army soldiers also filled out the DRS-15-R. Parts of this data have been described and published by Johnsen and colleagues in a previous study (Johnsen et al., 2013). Due to anonymity restrictions, exact age and gender were not recorded for all participants in this subsample. The group consisted of 222 privates serving in the armed forces as part of their mandatory military service. Their age ranged from approximately 18-23 years, and the group consisted almost exclusively of men.

Student sample: University students attending introductory psychology courses at the University of Bergen in Norway also filled out the DRS-15-R. Parts of this data have been described and published by Hystad and colleagues in a previous study (Hystad, Eid, Laberg, Johnsen & Bartone, 2009). Students who agreed to participate completed questionnaires during class. All students participated voluntarily and did not receive course credits for doing

so. This subsample consisted of 354 students (73.7% female) with a mean age of 21.68 (*SD* = 4.38).

Measures

      OCD. OCD symptom severity was measured using the Yale–Brown Obsessive Compulsive Scale (Y-BOCS; Goodman et al., 1989a, 1989b). The Y-BOCS consists of 10 items which are rated on a scale from 0 to 4, yielding a total score of 0-40. Y-BOCS interviews were conducted by trained clinicians pre- and post-treatment and at 3- and 6-month follow-up. A therapist at the clinic conducted pre-treatment interviews, while post- and follow-up interviews were conducted by an independent assessor by phone. The Y-BOCS has been reported to show good psychometric properties (Goodman et al., 1989a, 1989b).

      Resiliency. The *Dispositional Resilience Scale 15-Revised* (DRS-15-R; Hystad, Eid, Johnsen, Laberg & Bartone, 2010) was filled out pre- treatment for the OCD sample. A subsample of the OCD patients (*n* = 33) also answered the DRS-15-R post-treatment. The questionnaire consists of 15 items that are rated on a scale ranging from 0 (not at all true) to 3 (completely true). Six of the items are negatively phrased. The *commitment*, *control* and *challenge* facets are each measured by 5 items, e.g. "I really look forward to my work" and "Most of my life gets spent doing things that are worthwhile" (*commitment*); "By working hard you can nearly always achieve your goals" and "How things go in my life depends on my own actions" (*control*); "Changes in routine are interesting to me" and "I enjoy the challenge when I have to do more than one thing at a time" (*challenge*). Psychometric properties have been reported to be good for the DRS-15-R (Bartone, 2007). Missing items were replaced with the average score on the questionnaire for the individual patient. Questionnaires with more than 2 missing items were not included in the analyses. A total of 9 items were replaced in the OCD sample (0.007% of total items), 12 items were replaced in the student sample (0.002 % of total items) and no values were replaced in the military sample.

One patient in the OCD sample had two missing values; the rest of the replacements were single missing values. Cronbach's alpha coefficients were calculated for our OCD sample and were .77 for the total dispositional resilience score, and .76, .68, and .71 for the *commitment, control* and *challenge* facets respectively.

Statistical analyses

One-way ANOVAs with post-hoc tests were conducted to compare scores on the DRS-15-R and facet scores on *commitment, control* and *challenge* between the OCD-sample and the two reference groups. Effect sizes were calculated for differences between the OCD sample and the two reference groups using Cohens *d* with pooled standard deviations. An independent sample t-test was used to check for gender differences in DRS-15-R scores for the OCD and student samples. The relationship between age and resiliency was investigated using bivariate correlation. To investigate whether resiliency was related to OCD symptom severity, bivariate correlations were conducted using DRS-15-R scores, including all three facets, and Y-BOCS scores pre- and post-treatment and at follow-up. Bivariate correlations were also used to investigate relation between DRS-15-R scores and a) any comorbidity; b) comorbid depression; and c) comorbid anxiety (i.e. panic disorder, social phobia, general anxiety disorder or unspecified anxiety disorder).

Y-BOCS score post-treatment was used as an indicator of treatment response. When post-measure of Y-BOCS was not available (*n* = 5), the 3-month follow-up measure was used as an indicator of post-treatment status. Definition of follow-up was set to minimum three months post-treatment. Clinical meaningful change was investigated using the criteria suggested by Mataix-Cols et al. (2016), which states that a change in Y-BOCS score of ≥ 35% can be considered a meaningful treatment *response*, and that a patient can be considered in *remission* with a Y-BOCS score of ≤ 12. In order to investigate the predictive effect of resiliency pre-treatment on treatment outcome, two logistic regression analyses were run to

predict remission (Y-BOCS ≤ 12) post-treatment and at follow-up from DRS-15-R score pre-treatment. We controlled for age and gender based on findings from a meta-analysis which suggest higher age and higher proportion of women to be negatively related to effect sizes in studies of CBT for OCD (Öst et al., 2015). We also controlled for Y-BOCS score pre-treatment. To control for comorbidity we re-ran the last analysis three times, controlling for a) any comorbid diagnosis, b) comorbid depression and c) comorbid anxiety disorder (panic disorder, social phobia, general anxiety disorder or unspecified anxiety disorder). A third logistic regression analysis was run to investigate the individual contribution of the facets *commitment, control* and *challenge* to predict remission at follow-up, as research has suggested different facets might be important for health and stress coping (Eschleman et al., 2010; Johnsen et al., 2014; Sandvik et al., 2013). The main analyses were repeated with linear regression analyses to look for potential differences. A paired sample t-test was conducted comparing DRS-15-R scores-pre- and post-treatment to test whether resiliency changed after completing treatment. Finally, two independent sample t-tests were run to investigate whether remission status post-treatment and at follow-up were related to changes in resiliency scores from pre- to post-treatment.

Results

Preliminary data analysis

Skewness and kurtosis were investigated for the DRS-data to ensure correct usage in the following analyses. Skewness was found to be -.53 (*SE* = .10). Kurtosis was found to be 1.32 (*SE* = .19). Both values were in acceptable range for conducting linear data analyses.

Group Comparisons

There was a significant difference between the groups with respect to total scores on the DRS-15-R, $F(2, 662) = 83.36$, $p < .001$. As Levine's test was significant and the assumption about homogeneity of variance was violated, Games Howell post-hoc tests were

used. Although rather similar to Tukey's test in its formulation, the Games-Howell test does not assume equal variances and sample sizes. The post-hoc tests showed that OCD patients had lower total DRS-15-R scores than both reference groups. There was no difference between the student and soldier groups (p = .196, mean difference = 0.69). Post hoc tests also revealed a significant difference between the OCD sample and the reference groups on all facets of the DRS-15-R (p < .001). The difference was largest for total DRS-15-R score (d = 1.30 for OCD vs. students; d = 1.36 for OCD vs. soldiers) followed by the facets *commitment* (d = 1.10 for OCD vs. students; d = 1.10 for OCD vs. soldiers), *challenge* (d = 0.70 for OCD vs. students; d = 0.89 for OCD vs. soldiers) and *control* (d = 0.73 for OCD vs. students; d = 0.78 for OCD vs. soldiers). In sum, OCD-patients had considerable lower scores on resiliency compared to students and military soldiers pre-treatment. One-way ANOVAs with Games Howell post-hoc tests also revealed that OCD-patients still scored significantly lower than students and soldiers post-treatment on total DRS-15-R score and on the *commitment* facet, but not on the two other facets. DRS-15-R scores and significant differences between samples are displayed in Table 1.

An independent sample t-test revealed no gender differences in DRS-15-R scores, t(423)= .85, p = .40. DRS-15-R scores were negatively though weakly correlated with age r(434) = -.25, p < .001, as younger OCD patients and students tended to have somewhat higher resiliency scores.

[Table 1 near here]

OCD Treatment Effects

Mean Y-BOCS score was 26.0 pre-treatment (SD = 4.63), 10.1 post-treatment (SD = 5.27) and 11.7 at follow-up (SD = 6.99). Treatment was found to be effective, as 89.9% of the

patients were classified as responders (i.e. a change in Y-BOCS of $\geq$ 35%), and 73% were in remission (i.e. Y-BOCS $\leq$ 12) post-treatment. The corresponding figures for follow-up status were 78.7% response, and 59.6% remission. Cohen's d_z was calculated for the change from pre-treatment to post and follow-up as suggested by Lakens (2013), correcting for correlation between Y-BOCS scores, and was found to be 2.46 for pre- to post-treatment and 1.80 for pre-treatment to follow-up, corresponding to large effect sizes.

Correlations between resiliency and psychiatric symptoms

DRS-15-R scores pre-treatment were neither significantly correlated with Y-BOCS scores pre-treatment, $r = -.19$, $p = .075$ nor post-treatment, $r = -.18$, $p = .09$. None of the facets were significantly related to Y-BOCS post-treatment. However, a weak to medium correlation existed with Y-BOCS scores at follow-up, $r = -.32$, $p < .01$. The results revealed a weak negative relation between the *challenge* facet and Y-BOCS scores pre-treatment and at follow-up. Correlations between DRS-15-R, including all facets, and Y-BOCS scores pre- and post-treatment and at follow-up are displayed in Table 2. Some theories propose a u-shaped relationship between positive traits and outcome, so that both much and too little of a trait could be negative (Grant & Schwartz, 2011). A visual inspection of the data did not provide support for this hypothesis in our sample.

Having any comorbid diagnosis was significantly correlated with DRS-15-R scores pre-treatment, $r_s = -.43$, $p < .001$. Both comorbid depression ($r_s = -.28$, $p < .05$) and comorbid anxiety disorder ($r_s = -.32$, $p < .01$) were significantly correlated with resiliency pre-treatment. Comorbid diagnoses were related to lower resiliency scores.

[Table 2 near here]

Resiliency as a Predictor of Treatment Outcome

A logistic regression analysis was used to investigate predictive effects of age, gender, Y-BOCS score pre-treatment, and DRS-15-R scores pre-treatment for remission post-treatment. The model was not significant, X^2(4, $N = 89$) = 5.08, $p = .28$. Resiliency was not significantly related to post-treatment remission ($p = .26$)

The next logistic regression analysis was conducted to test whether age, gender, Y-BOCS pre-treatment and DRS-15-R scores pre-treatment predicted remission at follow-up. The model was significant, X^2(4, $N = 89$) = 10.45, $p < .05$. Whereas age, gender and Y-BOCS pre-treatment were not significantly contributing to the model, DRS-15-R score pre-treatment was significantly related to remission at follow-up. A one unit increase in DRS-15-R increased the odds by 1.11, indicating a minimal difference in follow-up status in favor of patients scoring higher on the DRS-15-R. We re-ran the analysis three times, controlling for a) any comorbid diagnosis, b) comorbid depression and c) comorbid anxiety disorder. None of the comorbidities significantly contributed to the model (any comorbid disorder $p = .26$, comorbid depression $p = .08$, comorbid anxiety $p = .41$).

Linear regression analyses adding age, gender, Y-BOCS pre-treatment and DRS-15-R pre-treatment displayed similar results as the logistic regression analyses for both post-treatment scores on the Y-BOCS (F(4, $N = 89$) = 1.62, $p = .18$) and follow-up scores on Y-BOCS (F(4, $N = 89$) = 3.65, $p < .05$).

To closer investigate the effects of the facets *commitment, control* and *challenge* for remission at follow-up, one last logistic regression analysis was run, adding age, gender, Y-BOCS pre-treatment and the three facets as independent variables. The model was not significant (X^2(6, $N = 89$) = 10.91, $p = .09$. None of the facets significantly contributed to the model. Details from the main regression analyses are displayed in Table 3. The procedure was replicated with a linear regression analysis which turned out significant (F(4, $N = 89$) = 2.83, $p < .05$). In this analysis, the *challenge* facet was the only significant contributor to the

model (p <.05). To summarize, resiliency pre-treatment was significantly, though weakly related to follow-up remission status, but not related to post-treatment remission status. Comorbidity did not affect the results, and neither of the facets *commitment* nor *control.* The *challenge* facet came out significant in the linear regression analysis, but not in the logistic regression analysis.

[Table 3 near here]

Does Resiliency Change as a Result of Treatment?

To investigate whether resiliency changed as a result of treatment, a paired-sample t-test was conducted. The analysis revealed a significant difference in DRS-15-R for pre-treatment scores (M = 24.70, SD = 6.85) and post-treatment scores (M = 27.66, SD = 6.57); $t(32)$ = -3.72, p <.01. Cohen's d_z was calculated for the paired-samples t-test, and was found to be 0.65, equivalent to a medium effect size. Corresponding effect sizes for the three facets were 0.50 for *commitment,* 0.43 for *control* and 0.43 for *challenge,* equivalent to medium effect sizes. Two independent sample t-tests revealed no significant differences in change scores on DRS-15-R for patients in remission vs. patients not in remission post-treatment $t(33)$= .12, p = .91, nor at follow-up $t(33)$= .25, p = .81. Change in resiliency was not significantly related to remission status post-treatment or at follow-up.

Discussion

The current study investigated resiliency in patients diagnosed with OCD. The main objectives of this study were to investigate differences in resiliency between OCD patients and two reference groups, examining the association between resiliency and OCD-symptoms before and after going through a concentrated four-day treatment, and finally to examine changes in resiliency scores after completing concentrated exposure therapy.

Resiliency and OCD

Our results revealed that OCD-patients scored significantly lower on the Dispositional Resilience Scale compared to university students and military soldiers both pre- and post-treatment. The largest difference was found for the *commitment* facet, a facet intended to measure engagement in tasks and sense of purpose. The lower scores on resiliency in the OCD group might indicate that higher resiliency works as a buffer against stress and psychopathology in general. In this sense, the fact that OCD-patients still scored significantly lower on the DRS-15-R post-treatment than the reference groups could indicate a vulnerability for relapse. On the other hand, it is possible that the disorder itself weakens the patients' resiliency. For example, OCD patients might have less sense of control, might view changes as overwhelming and have a less sense of purpose because of their OCD.

We found no relation between pre-treatment scores for OCD symptom severity and resiliency. Nor was there a significant relationship between Y-BOCS scores post-treatment and DRS-15-R post-treatment ($r = -.35$, $p =.05$). These results seemingly give little support to the hypothesis that lower resiliency scores in the OCD group is a result of their disease. This finding also contrasts previous studies in non-clinical groups by Hjemdal et al. (2011) and Sun et al. (2014), showing a relation between OCD symptoms and resiliency. On the other hand, comorbidity was found to be negatively related to resiliency scores. Consequently, the hypothesis that resiliency acts as a buffer against stress and psychopathology in general seems a more likely hypothesis. However there was a restriction in range in Y-BOCS scores pre-treatment, as all patients displayed high scores before initiating treatment, prompting caution in interpreting the results.

Pre-treatment resiliency scores were neither related to OCD symptom severity pre-treatment nor remission status at post-treatment. Resiliency was weakly related to follow-up remission status (odds ratio of 1.11) and weakly related to OCD symptom severity at follow-up. This implies that patients' initial resiliency does not hinder nor facilitate treatment effects.

However, considering its relation to follow-up status, resiliency might play a small role in maintaining change achieved during treatment, for instance through increasing homework compliance (which is completed after the four day treatment) or acting as a buffer preventing relapse. The latter might be explained by better stress management in patients with higher resiliency, as indicated by research on the relation between stress coping and resiliency (Eschleman et al., 2010). Likewise, a study of resilience in PTSD patients suggested that resilience might affect cognitive styles related to optimism and self-efficacy and hence protect against psychopathology (Davidson et al., 2012).

While resiliency is traditionally viewed as a reasonably stable personality characteristic (Bartone, 2007; Windle, Bennett, & Noyes, 2011), we found resiliency scores to improve significantly following treatment. There was an average difference of three points before and after treatment, equaling a difference of 0.65 Cohen's *d*. One explanation for this finding could be that patients learn something during treatment that enables increased resiliency. On the other hand, in line with our previously reported results, comorbid diseases (e.g. depression and anxiety) could make patients less resilient, and if anxiety and depression lifts following treatment, patients' resiliency scores might improve. This adds further evidence in favor of the hypothesis that resilience is more related to psychopathology and stress in general, and less to OCD specifically. At the same time, one should be careful to over-generalize this finding as this analysis was conducted with a moderate sample size.

Strengths and Limitations

One shortcoming of the current study is the small proportion of patients with both pre- and post-treatment measures of resiliency. Future studies should include more participants with repeated measures of resiliency. Another limitation concerns the comparison groups. There was an uneven distribution of age and gender in the three compared groups. Whereas

the military soldier group consisted almost exclusively of men, the student sample and the

OCD sample consisted mostly of women. Our results, however, revealed no gender

differences in DRS-15-R scores, and no significant difference in resiliency scores between the

male dominant soldier group and the female dominant student group. As our results revealed a

significant relation between age and resiliency, the age difference between the younger

comparison groups and the older OCD-group presents a limitation considering interpretation

of our findings. However, the correlation between age and resilience in the current sample

was weak. Also the comparison groups were not screened for psychopathology. This leads to

the next limitation; the lack of a comparison group with psychiatric patients. Previous studies

have linked lower resilience scores to the course of treatment outcome in PTSD and

depression (Camardese et al., 2007; Davidson et al., 2012), and our results indicate a link

between comorbid anxiety and depression and resiliency. It remains unknown whether low

resiliency could be a transdiagnostic factor in psychopathology, or whether low resiliency

scores are merely inflicted by psychopathology. It might also be that other measures of

resilience could be better at capturing resiliency in psychiatric populations, as DRS-15-R

originally was designed for measuring resiliency in military populations. Hence, we cannot

conclude whether our results are specific for OCD or whether the results would be the same

for other psychiatric disorders. As discussed above, it could be the case of a general

vulnerability. However, to our knowledge, this is the first study to use DRS-15-R in a clinical

population of patients with a psychiatric disorder. Future research should investigate this

further in other samples. Another limitation concerns the restriction of range in OCD scores.

The fact that all OCD-patients score high on the Y-BOCS before treatment might affect

correlations between Y-BOCS and DRS-15-R. Furthermore, the weak correlation between the

three subscales on the DRS-15-R, presents a next limitation, making it hard to interpret total

DRS-15-R scores. This is in line with criticism of the resiliency construct, which claims that

resiliency should be considered three separate phenomena rather than a unitary construct (Hull, Van Treuren, & Virnelli, 1987). However, there is also evidence in favor of viewing resiliency as a unitary general dimension (Hystad et al., 2010). Another shortcoming of our study is the lack of monitoring of homework compliance. As mentioned above, hardiness might contribute to relapse-prevention. Hence, it would be interesting to investigate whether hardiness (for instance the commitment facet) could be related to homework engagement. A final limitation is the urge of patients to discontinue use of anxiolytics. This was not formally monitored and might have led to symptom increase prior to treatment, representing a possible confounding variable.

One of the strengths of this study is the use of two different reference groups to compare measures of resiliency in OCD patients with populations that have already been studied and described in the literature. A second strength is the use of the cET treatment format which offers solid treatment outcome, presumably reducing the influence of several external factors, such as time effects, therapist competency and life events through offering the treatment over four consecutive days and thorough therapist training. It is also assumed the format yields high ecological validity as all OCD-patients in the current catchment area are referred to the clinic, which is part of the ordinary public health service.

Conclusion and Implications

The results show that patients with a diagnosis of OCD reported lower resiliency scores than students and military soldiers, but resiliency was unrelated to OCD symptoms pre- and post-treatment. The study further revealed a weak relationship between resiliency and remission at follow-up. Based on the data we recommend clinicians to offer ERP treatment regardless of patients' score on resilience, but to pay attention to patients with very low scores on resilience in the follow-up period. We also recommend future research to investigate resiliency in other patient groups, and to investigate resiliency in other treatment formats for

OCD to investigate whether the reported results are specific to our patient group and/or treatment format or could be generalized to other settings and samples. We also recommend future research to further look into the possibility of resiliency changing as a result of psychological treatment. Our results indicated this could be the case, albeit in a small subsample in the current study. Longitudinal studies are needed in order to investigate the development of resiliency and psychopathology to find out whether one might be a result of the other, or whether the development of the two are interlinked. Furthermore, research should aim at identifying treatment options for patients with poorer treatment response.

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Table 1.

Means, Standard Deviations and Comparisons of DRS-15-R- for all Three Subsamples, Including Pre- and Post-scores for OCD Subsample.

	OCD pre-treatment		Students		Soldiers		
DRS-15-R	*M*	*SD*	*M*	*SD*	*M*	*SD*	*Post-hoc*
Total	24.0	5.8	**30.6***	4.3	**31.3***	4.9	OCD < St., Sold.
Commitment	7.4	3.3	**10.4***	2.1	**10.5***	2.3	OCD < St., Sold.
Control	10.3	2.6	**11.9***	1.8	**12.1***	2.1	OCD < St., Sold.
Challenge	6.4	2.9	**8.3***	2.5	**8.7***	2.4	OCD < St., Sold.
	OCD post-treatment						
Total	27.7	6.6					OCD < St., Sold. **
Commitment	8.7	3.6					OCD < St., Sold. **
Control	11.1	2.5					No significant differences
Challenge	7.8	2.9					No significant differences

Note. DRS-15-R = Dispositional Resilience Scale 15-Revised. For the total sample, total DRS-15-R scores ranged from 8 to 45. Scores on *commitment* and *challenge* ranged from 0 to 15, and scores on *control* ranged from 3 to 15. Numbers for the soldier and student groups re-printed from Johnsen et al. (2013) and Hystad et al. (2009) with permission from the authors. OCD pre-treatment *n* = 89, OCD post-treatment *n* = 33, Soldiers *n* = 222, Students *n* = 354.
*Significantly different from OCD-sample pre-treatment as measured by one-way ANOVAs with Games-Howell post-hoc tests, $p < .001$.
** $p < .05$

Table 2

Correlations between DRS-15-R Pre-treatment, Including the Three Facets, and Y-BOCS
Scores.

Measure	1	a)	b)	c)	2	3
1. DRS-15-R total score	-					
a) *Commitment*	**.76****	-				
b) *Control*	**.60****	**.24***	-			
c) *Challenge*	**.61****	.15	.05	-		
2. Y-BOCS pre-treatment	-.19	-.20	.08	**-.23***	-	
3. Y-BOCS post-treatment	-.18	-.10	-.18	-.10	.15	-
4. Y-BOCS follow-up	**-.32****	-.15	-.19	**-.29****	**.22***	**.47****

Note. Y-BOCS = Yale-Brown Obsessive Compulsive Scale. DRS-15-R = Dispositional
Resilience Scale 15-Revised.
** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table 3.

Summary of Logistic Regression Analysis for Variables Predicting Remission Post-treatment and at Follow-up.

	B	SE B	e^B	p
Dependent: Remission post-treatment				
Age	-.03	.02	.98	.30
Gender	-.64	.53	.53	.23
Y-BOCS pre-treatment	-.07	.06	.93	.21
DRS-15-R	.05	.04	1.05	.26
Dependent:				
Remission at follow-up				
Age	-.02	.02	.98	.37
Gender	-1.00	.51	.37	**.05**
Y-BOCS pre-treatment	.00	.05	1.00	.99
DRS-15-R	.11	.04	1.11	**.01***
Dependent: Remission at follow-up				
Age	-.02	.03	.98	.39
Gender	-.99	.52	.37	.06
Y-BOCS pre-treatment	-.00	.05	1.00	.93
Commitment	.07	.07	1.07	.37
Control	.14	.10	1.15	.15
Challenge	.14	.09	1.14	.12

Note: Y-BOCS = Yale-Brown Obsessive Compulsive Scale. DRS-15-R = Dispositional Resilience Scale 15-Revised. e^b = exponential *B*. Remission defined as Y-BOCS $\leq$ 12. *Significant relations are displayed in bold.