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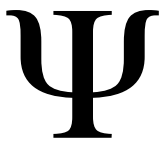

Illness perception in treatment seeking OCD patients

HOVEDOPPGAVE

profesjonsstudiet i psykologi

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Personal note

This article has been possible due to close cooperation with the OCD-team at Haukeland University Hospital, Bergen. I worked at the OCD-team as an assistant for almost three years while I was studying psychology. I participated in treatment as well as research, collecting quality-data from the fast growing number of patients. The subject of this article is illness perception in OCD patients and was chosen based on this work experience and discussions in the OCD-team. The time spent working on this paper has also increased my knowledge about treatment of anxiety disorders, especially OCD, and how I as a graduated psychologist can meet patients with these kinds of problems in the best way possible.

Audun Havnen and Gerd Kvale have been supervisors. I would like to thank them both for guidance and inspiring discussions. Most of all I want to thank my very best Øyvind for his patience and support.

Bergen, April 2015

Ragnhild Frotjold

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Abstract

Objective: The literature is inconclusive regarding predictors of treatment outcome in obsessive-compulsive disorder (OCD). Illness perception (IP) has been identified as an important predictor of treatment outcome in somatic and mental health, but has not previously been investigated in OCD patients. The aims of the present study were to investigate variables related to IP pre-treatment and to explore whether IP could predict treatment outcome. **Method:** A total of 76 patients were assessed with the Brief Illness Perception Questionnaire (B-IPQ), Y-BOCS and BDI. The OCD patients` IP was compared to reference-groups of patients with rheumatoid arthritis (RA) and bipolar disorder (BD). **Results:** The OCD-sample expressed generally severe illness perceptions, and in some aspects more severe compared to patients with RA and BD. OCD severity explained 18 % of pre-treatment IP variance. After treatment, significant positive changes in IP was seen. The B-IPQ dimension *coherence* explained 6 % of OCD severity post-treatment. **Conclusion:** The results indicate that B-IPQ is a useful instrument for capturing OCD patients` perceptions of disorder-specific symptoms, as well as a sensitive instrument for relatively rapid changes in OCD symptoms. However, only the perceptual dimension *coherence* was related to treatment outcome. Clinical and research implications are discussed.

Keywords: OCD, illness perception, the B-IPQ

Sammendrag

Målsetting: Flere studier har undersøkt prediktorer for behandlingsutfall hos pasienter med tvangslidelse (OCD) uten konkluderende resultater. Sykdomsoppfatning (Illness perception; IP) er identifisert som en viktig prediktor for behandlingsutfall i somatisk og psykisk helse, men har ikke tidligere blitt undersøkt hos pasienter med OCD. Målene med dette studiet var å undersøke variabler relater til IP før behandling, og å undersøke om IP kunne bidra til å predikere behandlingsutfall. **Metode:** Totalt 76 pasienter ble vurdert med Brief Illness Perception Questionnaire (B-IPQ), Y-BOCS og BDI. OCD pasientenes sykdomsoppfatning ble sammenlignet med pasienter med reumatoid artritt (RA) og bipolar lidelse (BD). **Resultater:** OCD utvalget oppfattet lidelsen sin som alvorlig, og i noen tilfeller mer alvorlig sammenlignet med referanseutvalg. OCD alvorlighetsgrad bidro til å forklare 18 % av variansen i generell sykdomsoppfatning før behandling. Det var signifikante positive endringer i sykdomsoppfatning etter behandling. B-IPQ dimensjonen *coherence* forklarte 6 % av variansen i OCD alvorlighetsgrad etter behandling. **Konklusjon:** Resultatene indikerer at B-IPQ er et hensiktsmessig instrument for å tilnærme seg OCD pasienters sykdomsforståelse i henhold til sykdomsspesifikke symptomer, i tillegg til å være et sensitivt instrument for relative raske endringer i OCD symptomer. *Coherence* var derimot den eneste dimensjonen som var relatert til behandlingsutfall. Implikasjoner for klinikk og forskning blir diskutert.

Nøkkelord: OCD, sykdomsoppfatning, B-IPQ

Introduction

Obsessive-compulsive disorder (OCD) is characterized by intrusive thoughts or images (obsessions) that lead to increased anxiety or discomfort, followed by intentional repetitive behavior (compulsions) aimed at anxiety reduction (American Psychiatric Association 2000, Abramowitz 1997). The World Health Organization has ranked the condition as one of the ten most debilitating illnesses (WHO 2001), and it is reported to be the fourth most common psychiatric diagnosis (Jenike 2001). Untreated, OCD tends to become chronic (Kessler et al. 2005). OCD has high comorbidity with a range of other disorders, among those depression and other anxiety disorders (Ruscio et al. 2010).

Cognitive-Behavioral Therapy (CBT) using Exposure- and Response-Prevention (ERP) is often considered the psychological treatment of choice for OCD, and is recognized as an effective and efficient approach (Abramowitz 1997, Öst et al. 2015). ERP has been proven effective when delivered in a range of different formats (Abramowitz 1996, Öst et al. 2015). A recent meta-analysis of all randomized-controlled trials on CBT for OCD published between 1993 and 2015 (Öst et al. 2015), applying Jacobson and Truax (1991) criteria for clinical significant change (CSC), showed proportions CSC varying from 43-52% following CBT. These results thus indicates that a large number of patients do not have satisfactory outcome.

Pampaloni et al. (2004) found that gender, duration, insight, severity, comorbidity, tics, side effects, previous treatment, drugs/challenge all were variables that influenced outcome. However, in the most recent meta-analysis to date (Öst et al. 2015), only the predictors gender, age, concurrent antidepressant medication and proportion of patients declining treatment were related to treatment outcome. Further, in

an earlier meta-analysis by Olatunji et al. (2013) only age was found to influence treatment outcome, and Rosa-Alcázar et al. (2008) found that only comorbidity contributed to treatment outcome. These results make it difficult to draw firm conclusions concerning treatment predictors.

From an extensive literature on the relationship between individual characteristics and treatment response in somatic conditions, we know that illness perception or the way patients understand their illness, has significant impact on illness coping strategies, treatment adherence and medication adherence (e.g. Hagger and Orbell 2003, Brown et al. 2001, Kucukarslan 2012). Illness perception, defined as the organized cognitive representations that patients have about their illness (Petrie et al. 2007), is identified as of importance also in mental disorders, but has to our knowledge, not previously been investigated as a possible predictor of treatment response in OCD patients. Previous research indicates that patients with mental disorders commonly have negative perceptions about chronicity and severity of the illness, and that negative illness perception influences health seeking behavior as well as the way they utilize care (Baines and Wittkowski 2013).

In the work of identifying patients` illness perception the Self-Regulation Model (SRM) has frequently been used as a framework for describing the perceptions people have about their health condition (Leventhal et al. 1984). This self-regulatory social cognition model has been extensively studied in physical illnesses, but has only recently started to receive attention in the study of mental disorders as well (Broadbent et al. 2008). The SRM proposes that individuals create common-sense beliefs regarding their illness, and that these beliefs are important for understanding and coping when faced with health threat (Petrie et al. 2008). Based on the principle of self-regulation the

model also proposes that people are active problem solvers who use emotional and cognitive illness perceptions to find solutions and adapt coping behavior accordingly (Leventhal et al. 1984). This is claimed to be a dynamic process where changes in symptoms or new information may lead to re-evaluation of the patients` perceptions of their illness and by this also a shift in coping behavior, help-seeking strategies or emotional response (Petrie et al. 2008, Baines and Wittkowski 2013). It has therefore been argued that trying to understand patients` illness perception and encourage health professionals in making treatment interventions more person-centered, is of importance regarding treatment acceptance, response and outcome (Williams and Steer 2011, Weinman and Petrie 1997). Individually tailored treatment could also be argued as of importance in a stepped-care perspective where identification of pre-treatment factors influencing treatment outcome, may be of importance in refining the ERP-based treatment to make the treatment more effective (Gilliam et al. 2010).

The SRM suggests that there is a consistent pattern in patients` illness perception and five distinct dimensions have been identified: *identity*, *timeline*, *consequences*, *cause* and *cure*/*contro*l (Leventhal et al. 1984). These dimensions have received empirical support from later research (Petrie et al. 2008). *Identity* includes the name of the illness and the range of symptoms that the patients perceive as associated with the condition. *Timeline* contain the patients` perception of how long the illness will last. *Consequences* assess the patients` perception of what kind of consequences the illness will have for their lives. *Cause* assesses what the patients` perceive as the cause of their illness, and *cure/control* the patients` perception of personal control of the illness and to what extent the illness can be influenced by treatment (Leventhal et al. 1980).

The five dimensions in illness perception are seen as interrelated. If illness is perceived as having severe consequences, it is likely that the illness also is perceived as having a longer timeline as well as negative perceptions related to treatment as helpful (Petrie et al. 2008). On the one hand, illness perception is a framework addressing illness symptomology, but on the other hand illness perception is also contributing to a description of the variance within the different illnesses. The variability of illness perception between patients with similar conditions, have been discussed as one of the most interesting aspects regarding illness perception and adds to the principle of individually tailored treatment as a way to assess and assist patients in their adjustment to illness and recovery (Petrie et al. 2008).

To assess illness perception the Illness perception questionnaire (IPQ) was developed based on the SRM model and the five perceptual dimensions (Weinman et al. 1996). The IPQ was later revised (IPQ-R; Moss-Morris et al. 2002), and the revised version has been adapted to a short form (the Brief Illness Perception Questionnaire; B-IPQ; Broadbent et al. 2006). In the B-IPQ the original five dimensions in the SRM-model has been revised and expanded, and the eight dimensions in the B-IPQ consists of: *consequences* (item 1), which assesses the perceived effect of the illness on the patient`s life. *Timeline* (item 2) assesses perceptions of how long the illness will last. *Personal control* (item 3) assesses how the patient` own behavior can influence the course of the illness, and *treatment control* (item 4) perceptions about available treatment. *Identity* (item 5) assesses perceived symptoms, and *concern* (item 6) concerns about the illness. *Coherence* (item 7) assesses how well patients believe they understand their illness and *emotional representations* (item 8) the perceived emotional influence on the patients` life (Broadbent et al. 2006). In addition there is an open-ended

question assessing perceived causal factors of the illness. The psychometric properties of the B-IPQ is reported to be good (Petrie et al. 2007). The B-IPQ has made possible a rapid assessment of illness perception compared to the IPQ or IPQ-R, and has by this offered the potential for investigating illness perception in a wider range of patients groups, using repeated measures or when illness perceptions are measured as part of a larger self-report battery (Broadbent et al. 2006).

In the present study the illness perception in two consecutive samples of OCD patients undergoing ERP treatment delivered during 4 consecutive days (Havnen et al. 2013, Havnen et al. 2014, Havnen et al. 2015), will be described using the dimensions in the B-IPQ. Since the intervention is highly concentrated, it might be argued that it is exceptionally suitable for studying the relationship between illness perception and treatment outcome with limited interference from treatment irrelevant factors or processes that usually run in parallel with the treatment and which might influence the outcome (e.g. life events, minor relapses, set-backs etc.). The format has been described as individual treatment in a group setting, in which each treatment group consists of 5-6 patients, and the ratio between patients and therapists are 1:1. During the 4-day intervention, the first day, lasting four hours, is allocated to psychoeducation to ensure that each patient understands and complies with the treatment principles, and to plan and specify individually tailored exposure tasks.

During the psychoeducation a number of disorder relevant aspects are covered, such as causes for OCD; heritability and individual vulnerability; precipitating and maintaining factors; personal control over the treatment outcome; typical mistakes during exposure training and the importance of response prevention; as well as information about the evidence-based treatment. At the end of the psychoeducation each

patient present suggestions for exposure tasks, and get feed-back to ensure that they cover all individually relevant domains.

Day 2 and day 3, each lasting approximately eight hours, are dedicated to therapist assisted exposure treatment in a variety of relevant settings. The last day is used for summarizing the treatment ("lessons learnt") and to plan the next three weeks of daily exposures that the patient will do on their own. The 4-day format is highly efficient and there is basically no drop-out. Also, the patients express a high degree of satisfaction with the approach (Havnen et al. 2014).

Since there is no previous research on OCD and illness perception, it is of interest to compare illness perception in OCD patients to illness perception in other chronic, but not life threatening, somatic as well as psychiatric disorders. As reference populations we have selected one group of patients with a chronic somatic disorder, rheumatoid arthritis (RA), and one group of patients with a severe mental disorder, bipolar disorder (BD). Severity of illness in patients with RA is especially associated with perceived negative consequences and less personal control of their illness (Rezaei et al. 2014), while in patients with BD negative perceptions regarding consequences, identity and personal control, have been associated with increased relapse-rates, and likelihood of greater fluctuations of depressed mood (Lobban et al. 2013). Thus, the aims of the current paper were:

1. To assess illness perceptions in a large sample of treatment seeking OCD patients, using patients with RA and BD as reference samples. Based on the diagnostic characteristics of the disorder, we expected that the OCD patients perceived their illness as quite severe with major consequences and negative

emotional impact on their lives as well as reduced personal control and a long illness timeline.

2. To explore to what extent pre-treatment illness perception were related to OCD severity, symptoms of depression, OCD duration, gender, age, use of SSRI, comorbidity and previous treatment experiences. We expected that higher OCD severity was associated with more negative perceptions on the B-IPQ dimensions.
3. To investigate the relationship between pre-treatment illness perceptions and treatment outcome after a 4-day intensive ERP-based group intervention. Based on previous findings in other somatic and mental disorders where illness perception has been associated with treatment outcome, we expected pre-treatment illness perception to be associated with treatment outcome.
4. To investigate possible changes in illness perceptions from pre-to post-treatment. Since the 4-day format is associated with substantial clinical improvement we expected significant changes in illness perception after the intervention.

Methods

Referral procedures, diagnostics and pre-treatment measurements.

All patients were referred to the OCD-clinic at Haukeland University Hospital, which is an outpatient unit part of the specialist health care. All adult patients in the Helse Bergen catchment area of 420.000 inhabitants, with potential OCD, are referred to this clinic. Prior to the first session all referred patients completed a standard battery of self-report questionnaires including the Beck Depression Inventory (BDI; Beck et al. 1996) and the Brief Illness Perception Questionnaire (B-IPQ; Broadbent et al. 2006).

Patients then met for an initial screening session during which the Norwegian version of Mini International Neuropsychiatric Interview (MINI; Leiknes et al. 2005) was administered to ensure a diagnosis of OCD (American Psychological Association 2000). Patients who met diagnostic criteria for OCD were then interviewed with the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al. 1989). The B-IPQ and Y-BOCS were administered before and after treatment. MINI and Y-BOCS interviews were conducted by trained clinical psychologists or a psychiatrist.

Post-treatment measurements

Post-treatment the patients were interviewed with the clinician administered Y-BOCS and completed the standard post-treatment self-report assessment which included the B-IPQ. The primary outcome measure was change in the Y-BOCS score and the B-IPQ dimensions from pre-treatment to one week post-treatment.

Measures

The Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al. 1989) was used to measure severity of obsessive-compulsive symptoms. The Y-BOCS consists of 10 items of which 5 cover the severity of obsessions and 5 cover the severity compulsions. Each item is rated from 0-4, total score range is 0-40 with higher scoring indicating higher degree of severity. The total score can be categorized as sub-clinical (0-7), mild (8-15), moderate (16-23), severe (24-31), and extreme (32-40). The Y-BOCS has good psychometric properties with reported Cronbach`s α ranging from 0.88 to 0.91 (Goodman et al. 1989). Cronbach`s α in the present sample was 0.74.

The Beck Depression Inventory (BDI; Beck et al. 1996) was used to assess symptoms of depression. BDI has 21 items which are rated on a 0-3 scale, where higher total score indicate more severe symptoms of depression, with a maximum total score of

63. The total score can be categorized as minimal (0-13), mild (14-19), moderate (20-24) and severe (>25) depression. The psychometric properties of BDI are well established (Beck and Steer 1984). Cronbach`s α in this sample was 0.886.

The Brief Illness Perception Questionnaire (B-IPQ; Broadbent et al. 2006, appendix 1) was used to assess illness perceptions. The B-IPQ is a nine-item questionnaire. The first eight items each assesses one dimension of illness perception; (1) *consequences,* (2) *timeline*, (3) *personal control*, (4) *treatment control*, (5) *identity*, (6) *concern*, (7) *coherence* and (8) *emotional representation*. The ninth item is an open ended question about the perceived cause of the illness where the respondents are to list the three most important factors they believe cause their illness (Broadbent et al. 2006). Due to limited responses this item was not analyzed in the present study.

The items are rated on a 0-10 Likert scale. The Likert scale indicates perceived severity of illness experience. In the current questionnaire the term *illness* was replaced with *obsessive-compulsive disorder* to specifically measure OCD and no other illnesses. The overall score for items 1-8 gives a scoring range of 0-80. When calculating the total score, items 3, 4 and 7 are reversed. The greater the score, the more severe the participant perceive their illness to be. Higher responses on the items 1, 2, 5, 6, and 8 represent more *negative* illness perceptions and higher scores on the items 3, 4, and 7 indicate more *positive* perceptions. In the present study the B-IPQ items were also analyzed separately and in these analysis the items 3, 4 and 7 were not reversed. The B-IPQ has demonstrated good test–re-test reliability and validity in previous research (Petrie et al. 2007, Broadbent et al. 2006). Cronbach`s α in the present sample was 0.50.

Sample characteristics

The current study is based on 76 patients (69.7 % female) from two consecutive samples, one with 35 patients (Havnen et al. 2014), and one with 41 patients described in Havnen et al. 2015. All patients took part in a 4-day concentrated group ERP treatment for OCD. For more detailed description of the treatment, see Havnen et al. (2013) and Havnen et al. (2014).

Age ranged from 18 to 69 years with a mean age of 32.11 (*SD* = 10.5). The self-reported length of the OCD was from 1 year up to 41 years and with a mean duration of 15.76 years (*SD* = 10.48). When referred to the clinic 40 (52.6 %) patients reported receiving pharmacological treatment prior to treatment. Of these, 31 (40.8 %) patients reported using SSRI. Y-BOCS-rated severity of OCD symptoms showed a mean sample score of 25.80 (*SD* = 4.23). The mean sub-scores for obsessions were 13.13 (*SD* = 2.17) and for compulsions 12.89 (*SD* = 2.48). In the present sample 71.1 % (*n* = 54) were classified with severe/extreme OCD (Y-BOCS 24-40), and 28.9 % (*n* = 22) were classified with moderate OCD (Y-BOCS 16-23).

Severity of depression measured with the BDI showed a sample mean score of 17.45 (*SD* = 9.1). A total of 23.7 % (*n* = 18) of the patients had BDI scores indicating severe depression (BDI > 25) prior to treatment. Further, 32.9 % (*n* = 25) had BDI scores indicating moderate depression (BDI 15-24), and 21.1 % (*n* = 16) had a BDI score indicating mild depression (BDI 10-14). A total of 17.1 % (*n* = 13) had BDI scores indicating minimal symptoms of depression (BDI 0-9). A total of 60.5 % (*n* = 46) had one or more comorbid diagnoses, mainly including other anxiety disorders and depression.

Improvement in OCD symptoms after treatment

Y-BOCS rated severity of OCD symptoms showed a sample mean score of 10.08 (*SD* = 4.38). Post-treatment severity of depression measured with the BDI showed a sample mean score of 11.01 (*SD* = 7.19). Applying the criteria for clinical significant change, used by Fisher and Wells (2005), 77 % of the patients in the sample were classified as recovered and 9.5 % as improved (Havnen et al. 2014, Havnen et al. 2015).

Previous psychological and pharmacological treatment

The patients were initially asked to report if they previously had received treatment or if they had not. A total of 82.9 % (*n* = 63) reported that they previously had received one or more treatments, including either psychological or pharmacological treatment, or both. Further, 5.3 % (*n* = 4) reported that they had not previously received psychological or pharmacological treatment, and 11.8 % (*n* = 9) had missing data regarding previous treatment.

Reference samples

Reumatoid arthritis: Rezaei et al. (2014) examined the role of illness perceptions in the relationship between depression and experienced pain in rheumatoid arthritis (RA). The patients were recruited from an outpatient rheumatology clinic affiliated with Isfahan University of Medical Sciences in Iran, during 2011 and 2012. The sample consisted of 100 patients, 72 females, with a mean age of 45.46 (*SD* = 12.67) and 28 males with a mean age of 40.68 (*SD* = 13.99). Disease duration ranged between 6 months and 26 years with a mean of 5.67 (*SD* = 5.74) years. Illness perceptions were measured using the B-IPQ.

Bipolar disorder: Lobban et al. (2013) explored the impact of illness perception on symptomatic outcome in bipolar disorder (BD). The sample consisted of 91 patients diagnosed with bipolar 1 or 2, with risk of future relapse. The patients were recruited from community mental health teams in England, UK. The sample consisted of 61 (67 %) female with mean age 45 (*SD* = 10.0) years. Mean duration of illness was 21 (*SD* = 12.0) years. Illness perceptions were measured using the B-IPQ modified for BD.

Statistical analyses

Statistical analyses were conducted in SPSS version 22. Data were analyzed using descriptive analysis, correlational analysis, independent and paired t-tests and stepwise multiple regression analyses. Independent t-tests were conducted to investigate the possible differences between the OCD patients and the two reference-groups BD and RA. An explorative correlational analysis was conducted to investigate the relationships between the dimensions in the B-IPQ, demographic variables and clinical aspects of OCD. Stepwise multiple regression analyses were then conducted to identify possible predictors of illness perception in the OCD patients prior to the 4-day intervention, with the B-IPQ total score and all the eight B-IPQ dimensions pre-treatment separately analyzed as the dependent variable. Paired t-tests were conducted to investigate changes in relevant variables from pre- to post-treatment. Also, a stepwise multiple regression analysis was conducted to test the influence of potential predictors on treatment outcome with Y-BOCS post-treatment score as the dependent variable.

Missing data. Seventy-eight patients were screened for inclusion. Two patients were excluded after initial screening because OCD was not the primary diagnosis. The total sample in the present analysis thus consisted of 76 patients. Five patients with

missing data on the B-IPQ were included in the descriptive statistics, but where excluded from further analyses.

Twenty-four patients had missing data on the B-IPQ post treatment. Independent t-tests were conducted in order to reveal significant biases in the missing data between the OCD patients with and without the B-IPQ post data. There were no significant differences between the two groups regarding pre-treatment OCD severity (Y-BOCS) $t(69) = 0.06$, $p = 0.95$, BDI $t(66) = 0.10$, $p = 0.91$, OCD duration $t(57) = -0.16$, $p = 0.87$, comorbidity $t(69) = 0.23$, $p = 0.81$, gender $t(69) = -0.05$, $p = 0.95$, age $t(69) = 0.021$, $p = 0.98$, previous treatment $t(64) = 0.36$, $p = 0.72$, or use of SSRI $t(67) = -0.68$, $p = 0.49$.

Ethics

The present study is a part of a standard quality control performed at the outpatient OCD-clinic at Haukeland University Hospital in Bergen, Norway, consented by the Personvernombudet 08.05.2012.

Results

Pre-treatment illness perception in OCD

Comparison of pre-treatment descriptive statistics of illness perception in OCD-patients, BD and RA are presented in Table 1. The OCD patients had a total B-IPQ score of 52.59 ($SD = 8.54$, scores 3, 4 and 7 were reversed), which indicate an on average high score compared to the possible maximum total score of 80. Total B-IPQ scores were not available for the reference samples. On the dimension *consequences* the OCD patients had a mean score of ($M = 8.08$, $SD = 1.70$), which indicate that the OCD patients perceived their illness as having significantly more negative consequences compared to patients with RA $t(169) = 10.38$, $p < .000$, while there were no significant differences compared to patients with BD.

On the dimension *timeline* the OCD-sample had a mean score of (M = 7.73, SD = 1.89), which indicate that the OCD patients perceived their illness to last longer compared to patients with RA $t(169) = 8.91$, $p < .000$, while there were no significant differences between the OCD patients and the patients with BD regarding this dimension. On the dimension *personal control* the OCD patients had a mean score of (M = 3.34, SD = 1.98), which indicate that the OCD patients perceived significantly lower personal control related to their condition compared to the patients with BD $t(158) = 3.52$, $p < .000$, as well as patients with RA $t(169) = 6.21$, $p < .000$. On the dimension *treatment control* the OCD patients had a mean score of (M = 7.47, SD = 2.19), which indicate that the OCD patients perceived treatment as more helpful compared to patients with RA $t(169) = 2.63$, $p = .009$, while there were no significant differences between the OCD patients and patients with BD regarding this dimension. On the dimension *identity* the OCD patients had a mean score of (M = 7.16, SD = 2.07), which indicate that the OCD patients perceived to have more symptoms related to their condition compared to patients with RA $t(169) = 6.26$, $p < .000$, while there were no significant differences between the OCD patients and the patients with BD regarding this dimension. On the dimension *concern* the OCD patients had a mean score of (M = 7.94, SD = 2.06), which indicate that the OCD patients were significantly more concerned about their illness compared to the patients with BD $t(160) = 3.02$, $p = .0029$, as well as patients with RA $t(169) = 8.41$, $p < .000$. On the dimension *coherence* the OCD patients had a mean score of (M = 6.17, SD = 2.66), which indicate that the OCD patients had less understanding of their illness compared to patients with BD $t(160) = 2.13$, $p = .034$, but a higher understanding of their illness compared to patients with RA $t(169) = 2.67$, $p = .008$. Also, on the dimension *emotional representations* the OCD

patients had a mean score of (M = 8.49, SD = 1.46), which indicate that the OCD patients perceived their OCD as having substantially more negative emotional impact on their lives compared to patients with RA $t(169) = 10.45$, $p < .000$, while there were no significant differences between the OCD patients and the patients with BD regarding this dimension.

(Insert Table 1 here)

Variables related to pre-treatment illness perception

Correlational analysis. An explorative correlational analysis was conducted to investigate the relationships between the dimensions in the B-IPQ, OCD-severity pre-treatment (Y-BOCS total score), BDI, OCD duration, comorbidity, age, gender, use of SSRI, and previous treatment. Illness perception correlated significantly with Y-BOCS on several of the B-IPQ dimensions: *consequences* (r = 0.50, $p < .001$), *timeline* (r = 0.27, $p < .05$), *personal control* (r = -0.46, $p < .001$), *identity* (r = 0.32, $p < .01$), *emotional representations (*r = 0.45, $p < 0.001$) and the B-IPQ total score (r = 0.44, $p < .01$). Illness perception correlated significantly with BDI on the B-IPQ dimensions: *consequences* (r = 0.26, $p < 0.05$), *personal control* (r = -0.26, $p < .05$), *concern* (r 0.25, = $p < .05$), *emotional representations* (r = 0.36, $p < .01$), and the B-IPQ total score (r = 0.33, $p < .01$). The B-IPQ dimension *timeline* correlated significantly with OCD duration (r = 0.32, $p < .05$). The B-IPQ dimension *identity* correlated significantly with age (r = 0.26, $p < .05$), as well as there were significant correlations between the dimension *personal control* and comorbidity (r = -0.28, $p < .05$), and the B-IPQ total score and comorbidity (r = 0.28, $p < .05$). Gender, previous treatment and use of SSRI

did not significantly correlate with any variables, and were therefore excluded from further analyses. A summary of these correlations are shown in Table 2.

(Insert Table 2 here)

Regression analyses. To investigate which variables that could account for systematic variance in pre-treatment illness perception, a number of analogous stepwise multiple regression analyses were conducted with the B-IPQ total score or each of the B-IPQ dimensions as dependent variables. Based on the explorative correlational analysis (see Table 2) the variables OCD severity (Y-BOCS total score pre-treatment), OCD duration, symptoms of depression (BDI), comorbidity, and age were selected as the predictor variables in each of the following analyses.

The B-IPQ total score as the dependent variable and the above described predictors: Pre-treatment OCD severity explained 18 % of the variance in illness perception ($F1, 55 = 12.32, p < .01$). The remaining variables did not explain additional variance, and were not entered.

Consequences as the dependent variable and the above described predictors: Pre-treatment OCD severity pre-treatment was entered in step one and contributed to the explanation of 26 % of the variance regarding perceived *consequences* ($F1, 55 = 20.05, p < .001$).

Duration as the dependent variable and the above described predictors: Pre-treatment OCD duration was entered in step one and explained 9% of the variance in perceived *timeline* ($F1, 55 = 5.61, p < .05$).

Personal control as the dependent variable and the above described predictors: Pre-treatment OCD severity pre-treatment were entered in step one and explained 16 % of the variance regarding *personal control* ($F1, 55 = 10.99$, $p < .01$).

Identity as the dependent variable and the above described predictors: Pre-treatment OCD severity pre-treatment was entered in step one and explained 10 % of the variance regarding *identity* ($F1, 55 = 6.70$, $p < .05$). Age was entered in the second step and added another 7 % of the variance in the model ($F2, 54 = 5.66$, $p < .05$).

Emotional representations as the dependent variable and the above described predictors: Pre-treatment OCD severity pre-treatment was entered in step one and explained 24 % of the variance regarding *emotional representations* ($F1, 55 = 18.02$, $p < .001$). BDI was entered in step one and added another 8 % of the variance in the model ($F2, 54 = 12.24$, $p < .05$).

Treatment control, concern and coherence as the dependent variable and the above described predictors: None of the predictors contributed significantly to explained variance in the dimensions *treatment control, concern and coherence.* A summary of the stepwise multiple regression analyses are shown in Table 3.

(Insert Table 3 here)

Changes in illness perception from pre- to post-treatment

Paired t-tests were used to compare changes in each of the illness perception dimensions from pre-to post-treatment. There were significant reduction in the dimension *consequences* from pre- to post-treatment $t(46) = 14.29$, $p < .000$, ($M = 3.45$, $SD = 1.81$), which indicate that the OCD had less impact on the patients` life after the

group-intervention. Significant reduction in the perceived *timeline* $t(46) = 9.35$, $p < .000$, ($M = 3.79$, $SD = 2.39$), indicates that the OCD patients did not perceive their illness to last as long as they did before the treatment. Significant increase in perceived *personal control* $t(46) = -8.91$, $p < .000$, ($M = 6.79$, $SD = 2.07$), indicate that the OCD patients had more positive perceptions regarding their own personal influence on their OCD after the intervention. There were also significant increase regarding *treatment control* $t(42) = -2.60$, $p < .013$, ($M = 8.28$, $SD = 1.62$), which indicate that the OCD patients had more positive perceptions about treatment as helpful. Significant reduction regarding the dimension *identity* $t(45) = 7.29$, $p < .000$, ($M = 4.28$, $SD = 1.89$), indicate that the patients perceive fewer symptoms related to their OCD after the intervention. There were significant reduction in perceived *concern* $t(46) = 8.98$, $p < .000$, ($M = 3.94$, $SD = 2.17$), which indicate that the OCD patients had less negative perceptions regarding concern about their OCD after the treatment. A significant increase in perceived *coherence* $t(46) = -6.50$, $p < .000$, ($M = 8.38$, $SD = 1.40$) after treatment, indicate that the OCD patients gained a higher understanding for their illness. Significant reduction in *emotional representations* $t(46) = 9.11$, $p < .000$, ($M = 5.00$, $SD = 2.35$), indicate that the OCD patients perceived their OCD as having less emotional impact after the treatment. The significant reduction in the B-IPQ total scores from pre- and post-treatment $t(46) = 12.73$, $p < .000$, ($M = 6.91$, $SD = 11.74$, scores on items 3, 4 and 7 were reversed), indicate an overall change where illness perceptions have less negative impact following treatment.

Pre-treatment illness perception as predictor of post-treatment OCD severity

To investigate potential variables that could predict OCD severity following treatment, two stepwise multiple regression analyses were conducted with the Y-BOCS

total post-scores as the dependent variable. The purpose of the first analyses was to determine whether variables reported as predictors in previous research also explained variance in treatment-outcome in the current sample. Pre-treatment OCD severity and pre-treatment B-IPQ total score were highly correlated, and we decided therefore not to include these two variables simultaneously in the first analysis. In the first analysis we selected variables which have been suggested as treatment predictors by previous research (Öst et al. 2015, Olatunji et al. 2013, Rosa-Alcázar et al. 2008), and the predictor variables were thus symptoms of depression (BDI), age, comorbidity, duration of OCD and Y-BOCS-rated OCD severity. None of the predictor variables entered in the analysis, which indicated that none of the variables contributed to the explanation of the treatment outcome. In the second analysis we selected the B-IPQ total score as well as each of the B-IPQ subscales as predictors. The results showed that the dimension *coherence* explained 6 % of the variance of OCD severity post-treatment measured by Y-BOCS ($F1, 63 = 4.16, p < 0.05$). The remaining variables were not entered into the equation and were therefore excluded.

Discussion

The aims of the present study were to assess illness perception in a sample of OCD patients prior to and after a 4-day ERP-based group intervention, and to determine to what extent illness perception was related to treatment outcome. We found that OCD patients expressed significantly equal as well as more severe degrees of illness perception compared to two reference populations. This is an interesting finding, given that OCD is ranked by the WHO as one of the ten most debilitating disorders with a chronic course. The main finding of the present study was that the B-IPQ dimension coherence was the only variable emerging as a significant predictor of treatment

outcome. Our study did not show empirical support for the predictors gender, previous treatment, and the use of SSRI, which have been identified by previous research to influence treatment outcome (Öst et al. 2015, Olatunji et al. 2013, Rosa-Alcázar et al. 2008).

The OCD patients perceived their illness as severe with substantial consequences and negative emotional impact as well as reduced personal control and a long illness timeline. They also perceived having many symptoms and significant concern about their illness. The only dimension with a more positive perception was treatment control, where the OCD patients perceived treatment to be more helpful compared to the reference-sample RA. Since the OCD-sample consists of treatment seeking patients, this finding can be expected.

The main differences between the patients with OCD and the reference-samples were that the OCD patients were more concerned about their illness, and they perceived having lower personal control. Another finding was that the OCD patients perceived their illness to last longer compared to patients with RA, and they had similar perception of illness timeline as patients with BD. This is interesting due to the chronicity of both RA and BD which also is a relevant aspect of OCD if untreated, though OCD is highly treatable for the majority of patients (Öst et al 2015). The OCD-patients also perceived their illness to have substantially more negative impact on their lives, both emotionally and related to illness consequences, compared to patients with RA. This is in line with literature commonly reporting that OCD patients have substantially reduced quality of life as a result of their illness (Abramowitz 1997). The OCD patients perceived similar illness severity compared to patients with BD regarding *consequences*, *treatment control*, *identity*, and *emotional representations*, which again

is interesting considering the chronicity of BD compared to the possibilities of recovery for OCD patients.

Pre-treatment OCD severity was the only significant predictor of pre-treatment illness perception, specifically the OCD severity was related to perceived *consequences, personal control* and *emotional representations.* The duration of the OCD also explained some of the perceived illness *timeline.* This is interesting, especially since the variables BDI, age, and comorbidity did not explain any of the variance in pre-treatment illness perception. In sum, these findings makes sense, since illness perception is expected to be closely related to disorder-specific symptoms, and thus confirms the B-IPQ as a disorder-sensitive questionnaire. Previous studies have specifically identified personal control as a dimension of importance, where increased perceived control have been associated with a positive treatment outcome (Baines and Wittkowski 2013). However, the dimension personal control did not influence treatment outcome in the present study.

The 4-day ERP-intervention was highly effective, and it is important to note that despite the patients' negative illness perceptions, these perceptions did not prevent the patients from gaining substantially from the treatment. Overall the results indicate that even severely negative pre-treatment illness perception, did neither prevent the treatment effect or treatment adherence. A total of 64 patients in the OCD-sample were categorized as having clinical significant change, where 77 % were classified as recovered and 9.5 % as improved (Havnen et al. 2014, Havnen et al. 2015). The recovery percentage was a somewhat larger proportion compared to previous studies on ERP (Fisher and Wells 2005).

As expected, the illness perception in the OCD-sample changed significantly from pre- to post treatment on all dimensions. Again, this supports the B-IPQ as a disorder-specific instrument sensitive for relatively rapid changes in symptoms. The literature also indicates that patients` illness perceptions are part of a dynamic process, where symptom reduction or psychoeducational aspects, like new information about the illness, may lead to re-evaluations of the perceptions of illness (Petrie et al. 2008), and influence treatment outcome.

One of the main findings in the current study was that the OCD patients gained a significantly higher understanding (coherence) of their illness post-treatment. Based on the current design, we do however not know whether this change occurred after the initial psychoeducation, or after the therapist-assisted ERP. In order to address temporal changes in illness perception and their possible relationship with treatment outcome, patients might be randomized to either receive the psychoeducation e.g. minimum two weeks prior to ERP-treatment or immediately before like in the current study, and changes in both illness perception and OCD symptoms measured in parallel pre, during and post the interventions. In future studies it would also be of interest to investigate whether illness perception would be predictive of relapse in OCD-patients. There are results in other illnesses indicating such influence, as in bipolar disorder where illness perception did contribute to the prediction of time to relapse (Lobban et al. 2013).Whether illness perception contribute to the explanation of relapse in OCD patients could be investigated by measuring illness perception and OCD symptoms e.g. six months as well as one year after the treatment. The information about temporal changes in illness perception and illness perception as predictor of relapse might be of clinical relevance, especially in a stepped-care perspective regarding the optimization of

individually tailored treatment (Gilliam et al. 2010). Individually adjusted treatment is also in previous literature argued to be of importance for treatment acceptance, response and outcome (Williams and Steer 2011, Weinman and Petrie 1997).

A possible limitation of the current study is related to the limited number of reference-groups available for comparison. Most of the studies on illness perception have studied somatic populations with little research on mental health. In addition the majority of the literature on illness perception has applied the IPQ, the IPQ-R or adjusted versions of the B-IPQ, which makes comparison more difficult.

In conclusion, the present study is the first to show that illness perception is a useful model assessing OCD patients` perspectives of their disorder and symptoms, but also of interest exploring the individuality within the perceptual dimensions. The 4-day intervention employed in the current study is considered a good model for investigating potential predictors for treatment outcome, such as illness perception. The reason for this is the concentrated format which can be considered close to a controlled, experimental intervention with all active treatment components delivered during four consecutive days. However, it would have been more feasible if illness perception also were measured immediately after the psychoeducation. Applying the 4-day intervention in this study showed that illness perception contributed to the explanation of treatment outcome only by the dimension *coherence*. At the same time, the pre-treatment negative illness perceptions did not influence treatment adherence or recovery.

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Table 1. *Mean scores B-IPQ of OCD sample and comparisons with BD and RA*

	OCD		BD		RA	
Dimensions	N=71		N=88-91		N=100	
	M (SD)	Range	*M (SD)*	Range	*M (SD)*	Range
Consequences	8.11 (1.72)	3-10	7.38 (2.76)	1-10	4.83 (2.23)	1-10
Timeline	7.73 (1.89)	2-10	7.27 (2.98)	1-10	5.05 (1.94)	2-10
Personal control	3.34 (1.98)	0-9	4.69 (2.70)	1-10	5.08 (1.67)	1-9
Treatment control	7.47 (2.19)	2-10	7.44 (2.37)	1-10	6.62 (1.99)	0-10
Identity	7.16 (2.07)	1-10	7.01 (2.51)	1-10	5.17 (2.03)	1-9
Concern	7.94 (2.06)	1-10	6.71 (2.90)	1-10	5.22 (2.1)	1-10
Coherence	6.17 (2.66)	1-10	7.08 (2.72)	1-10	5.1 (2.52)	0-10
Emotional repr.	8.49 (1.46)	4-10	8.44 (2.03)	1-10	5.33 (2.23)	1-10

Note. OCD = Obsessive-Compulsive Disorder; BD = bipolar disorder (Lobban et al. 2003); RA = rheumatoid arthritis (Rezaei et al. 2014); Emotional repr. = Emotional representations; *M* = mean; *SD* = standard deviation.

Table 2. *Intercorrelations between pre-treatment illness perception and clinical aspects*

Dimensions B-IPQ	Y-BOCS	BDI	Duration	Comorbidity	Age
Consequences	**0.51**[a]	**0.26**[b]	0.19	0.08	0.05
Timeline	**0.27**[b]	0.13	**0.32**[b]	0.24	-0.01
Personal control	**-0.46**[a]	**-0.26**[b]	-0.00	**-0.28**[b]	0.01
Treatment control	0.08	-0.15	0.05	-0.23	0.04
Identity	**0.32**[a]	0.16	0.23	-0.01	**0.26**[b]
Concern	0.20	**0.25**[b]	0.12	0.18	0.13
Coherence	0.01	0.03	0.18	-0.05	0.02
Emotional representations	**0.45**[a]	**0.36**[a]	0.05	0.21	-0.09
The B-IPQ total score	**0.44**[a]	**0.33**[a]	0.15	**0.28**[b]	0.06

Note. Y-BOCS = Yale-Brown Obsessive-Compulsive Scale, BDI = Becks Depression Inventory, Duration = OCD-duration. Significant variables are highlighted.
[a] $p < 0.01$, two-tailed, [b] $p < 0.05$, two-tailed.

Table 3. *Stepwise multiple regression of predictors of pre-treatment illness perception*

	Multiple *R*	*B*	SE B	Beta	*t*
B-IPQ total score					
Step 1					
Y-BOCS pre	0.42	0.88	0.25	0.42	3.51[b]
Consequences					
Step 1					
Y-BOCS pre	0.51	0.22	0.05	0.51	4.51[c]
OCD-duration					
Step 1					
OCD-duration	0.30	0.05	0.02	0.30	2.36[a]
Personal control					
Step 1					
Y-BOCS pre	0.40	-0.18	0.05	-0.40	-3.31[b]
Identity					
Step 1					
Y-BOCS pre	0.33	0.18	0.06	0.35	2.83[a]
Step 2					
Age	0.41	0.05	0.02	0.25	2.05[a]
Emotional representations					
Step 1					
Y-BOCS pre	0.49	0.15	0.04	0.43	3.74[c]
Step 2					
BDI	0.55	0.04	0.02	0.26	2.26[a]

Note. Y-BOCS = Yale-Brown Obsessive-Compulsive Scale; B-IPQ = Brief Illness Perception Questionnaire; SE B = standard error B. Only significant predictors were entered in the analysis.

[a] $p < 0.05$, two-tailed, [b] $p < 0.01$, two-tailed, [c] $p < 0.001$, two-tailed.

Appendix 1
BIPQ

Vennligst sett en ring rundt det tallet som best samsvarer med din mening om de følgende spørsmålene.

Hvor mye påvirker sykdommen livet ditt?

0	1	2	3	4	5	6	7	8	9	10
Ingen påvirkning										Voldsom påvirkning

Hvor lenge tror du at sykdommen din vil vare?

0	1	2	3	4	5	6	7	8	9	10
Svært kort tid										For alltid

Hvor mye kontroll føler du at du har over sykdommen din?

0	1	2	3	4	5	6	7	8	9	10
Absolutt ingen kontroll										Svært stor kontroll

Hvor mye mener du at behandlingen din kan hjelpe mot sykdommen din?

0	1	2	3	4	5	6	7	8	9	10
Ikke i det hele tatt										Svært hjelpsom

Hvor mye opplever du symptomer fra sykdommen din?

0	1	2	3	4	5	6	7	8	9	10
Ingen symptomer i det hele tatt										Mange alvorlig symptomer

Hvor bekymret er du angående sykdommen din?

0	1	2	3	4	5	6	7	8	9	10
Ikke bekymret i det hele tatt										Svært bekymret

Hvor godt føler du at du forstår sykdommen din?

0	1	2	3	4	5	6	7	8	9	10
Forstår ikke i det hele tatt										Forstår svært godt

Hvor mye påvirker sykdommen din deg følelsesmessig? (dvs gjør den deg sint, redd, urolig eller deprimert?)

0	1	2	3	4	5	6	7	8	9	10
Ikke påvirket følelsesmessig i det hele tatt										Svært påvirket følelsesmessig

Vennligst skriv ned i rekkefølge de tre viktigste faktorene som du tror forårsaket sykdommen din. ***De aller viktigste årsaker for meg:***

1. _____ 2. _____ 3. _____