




# Comparison Between Obsessive Compulsive Disorder and Panic Disorder on Metacognitive Beliefs, Emotional Schemas, and Cognitive Flexibility

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## Abstract

We aimed to investigate the similarities and differences between patients with OCD and PD, and healthy control subjects (NPC) on their metacognitive beliefs, emotional schemas, and cognitive flexibility. We hypothesized that the clinical groups would score higher than the NPC group on their dysfunctional metacognitive beliefs and negative beliefs about emotional schemas, and lower than the control subjects on their cognitive flexibility. Regarding the metacognitive beliefs, the clinical groups scored higher than the NPC group on the scores of the uncontrollability and danger, the need to control thoughts subscales, and on the total score of the MCQ-30. On the uncontrollability, comprehensibility, rumination, dissimilarity, dangerousness, and guilt dimensions, and on the total score of the LESS, the clinical groups scored significantly higher than the NPC group. The NPC group obtained higher scores than the clinical groups on the Cognitive Flexibility Inventory. Focusing on the psychological concepts that differentiate patients with OCD and PD from healthy controls might help identify potential targets for psychotherapy.

**Keywords** Cognitive flexibility · Emotional schema · Metacognition · Obsessive-compulsive disorder · Panic disorder

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## Introduction

Transdiagnostic approaches to psychiatric disorders suggest that there may be common underlying mechanisms which may serve as either predisposing or perpetuating factors (Allen et al. 2008; Boisseau et al. 2010; Ellard et al. 2010; Harvey and Watkins 2004). Some proposed transdiagnostic cognitive and behavioral mechanisms include selective attention to internal or external stimuli, attentional avoidance and attention towards safety, recurrent thinking, avoidance behaviors, experiential avoidance, executive and attentional control deficits, and interpretational, expectancy, and emotional reasoning among others (Harvey and Watkins 2004; Morris and Mansell 2018). Recent advances in research on transdiagnostic treatments for anxiety disorders in adults have generally suggested that they are at least as effective as disorder-specific cognitive behavioral therapy (CBT) approaches (Andersen et al. 2016; Newby et al. 2015; Pearl and Norton 2017; Reinholt and Krogh 2014). Current evidence for transdiagnostic treatments based on CBT approaches have so far demonstrated that they lead to large treatment effects on the primary anxiety disorder as well as to a significant reduction on the severity of the comorbid disorders and that the proposed underlying psychological mechanisms may have an impact on their treatment effectiveness. On the other hand, the current literature consists mainly of studies with small sample sizes, and there is still only a limited number of studies that directly compare disorder-specific CBT approaches to transdiagnostic treatments (Rector et al. 2014). Therefore, more research focusing on transdiagnostic mechanisms in psychiatric disorders is warranted.

Although obsessive-compulsive disorder (OCD) is officially no longer classified in the section for anxiety disorders in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM 5), panic disorder (PD) and OCD are two psychiatric disorders with a common presenting problem of anxiety (American Psychiatric Association 2013). PD is characterized by catastrophic misinterpretations of suddenly and unexpectedly occurring physical symptoms, i.e., panic attacks, whereas OCD is characterized by repetitive intrusive thoughts, impulses, or images, and mental or behavioral rituals to control the anxiety caused by these mental events (Kwak and Lee 2015). OCD affects between 1.5 and 3% of the adult population (Ruscio et al. 2010), and the lifetime prevalence for PD is 1.7% (de Jonge et al. 2016).

CBT is generally recommended as the first-line psychologic treatment for both OCD and PD (Hofmann and Smits 2008). CBT has been shown to be at least as effective as pharmacological treatment for PD and OCD. However, there are some patients who fail to respond to CBT or experience a relapse after initial improvement. Previous reports have demonstrated that up to 23% of patients with PD, who received CBT and were remitted, had a relapse during their follow-up. In addition, almost half of the patients with OCD failed to respond to CBT (Fava et al. 2001). Thus, it is possible that a different approach than traditional CBT approaches may be required for such patients. Many of these additional treatment approaches are often referred to as “newer generation of CBT,” “contextual CBT,” or “third wave of CBT” (Bluett et al. 2014). Most of these newer generation CBT approaches, e.g., Metacognitive Therapy (MCT), Emotional Schema Therapy (EST), and Acceptance and Commitment Therapy (ACT), are based on transdiagnostic principles (Hayes et al. 2011; Leahy 2002; Wells 2009), and some of the core components targeted during these treatments, i.e., metacognitive beliefs, emotional schemas, and cognitive flexibility, respectively, are all among the

proposed transdiagnostic processes (Edwards and Wupperman 2019; Hayes et al. 2011; Leahy 2018; Levin et al. 2014; Sun et al. 2017; Sighvatsson et al. 2019; Wells 2009).

The metacognitive theory proposes that beliefs about the significance, dangerousness, uncontrollability, or special meaning of cognitions and the need to control them, self-focused attention, threat monitoring, repetitive negative thinking, and unhelpful or backfiring coping mechanisms may be specifically related with psychopathology (Hezel and McNally 2016; Twohig et al. 2018; Wells 2009). Metacognitions may be defined as the cognitive processes which are involved in the awareness, control, regulation, monitoring, modification, and appraisal of thinking (Wells 2009). Previous studies investigated metacognitive beliefs in both PD and OCD. For example, negative beliefs concerning the dangerousness and uncontrollability of worry, the elevated need to control thoughts, and a lack of confidence in the cognitive processes like attention, concentration, and memory have been reported in OCD (Moritz et al. 2010). Another study by Cartwright-Hatton and Wells (1997) found that generalized anxiety disorder (GAD) and OCD patients did not differ from each other significantly on the uncontrollability and danger and cognitive confidence subscales of the Metacognitions Questionnaire (MCQ-30). OCD patients had significantly higher scores than other participants on the cognitive self-consciousness subscale of the MCQ-30. Therefore, an intensive focus on thought processes may better define OCD patients than other clinical disorders, e.g., GAD (Cartwright-Hatton and Wells 1997). Clinical research on the metacognitive profile of OCD patients over the years has replicated these findings and supported the validity of the metacognitive model for OCD, which posits that beliefs about the meaning, significance, power, dangerousness of intrusions or feelings, and the consequences of them, and beliefs about the necessity to perform rituals or the negative consequences of failing to perform them in addition to beliefs about rituals and inappropriate stop signals for self-regulation may be responsible for OCD symptoms, consistently (Exner et al. 2009; Fisher and Wells 2008; Gwilliam et al. 2004; Hermans et al. 2008; Janeck et al. 2003; Moritz et al. 2010; Myers and Wells 2005; Solem et al. 2009; Wells 2009; Wells and Papageorgiou 1998). However, the metacognitive model of PD and research on metacognitive beliefs in PD has not been as extensively reported in the literature. In one of these studies, the authors reported that the metacognitive beliefs of patients with persecutory delusions and PD patients were similar to each other, and elevated in comparison to control subjects, which was interpreted as a finding that metacognitive beliefs might be generic vulnerability factors (Morrison and Wells 2003), and yet in another study, patients with PD were characterized as having high health worry and intermediate levels of negative metacognitions when contrasted with GAD patients, and that the difference in meta-worry between these two diagnostic groups might have been less pronounced because some negative appraisals of PD patients were thought to be synonymous with meta-worry (Wells and Carter 2001). A further study also reported elevated dysfunctional metacognitive beliefs in PD patients compared to healthy controls, but no significant differences between PD and GAD patients (Aydin et al. 2019). In summary, the current metacognitive model of PD suggests that dysfunctional metacognitive beliefs in PD may manifest themselves as negative beliefs about worry and the need to control thoughts. These beliefs are thought to result in increased self-consciousness, which may lead to an increase of anxiety, especially worries about physical health. The model further suggests that selective attention to bodily sensations may be strengthened in this way, and the perceived level

of danger or threat to well-being may become more and more certain and real. This model is in line with clinical observations, where such metacognitive beliefs validate the patient's idea of an imminent catastrophe, which in turn augments the vicious cycle of pathologic anxiety and worry (Cucchi et al. 2012). Moreover, in the only study directly comparing OCD and PD patients on their metacognitive beliefs, participants in both groups reported higher scores on negative beliefs about worry, and need to control thoughts and cognitive self-consciousness than healthy control subjects. Further, the OCD group had higher scores on cognitive confidence than healthy controls. The authors concluded that both patient groups had a sense of losing control of their cognitions, interpreted this sense as dangerous, and tried to cope with their experience by focusing more attention to their cognitive processes or thought suppression. This study demonstrated that no significant differences in metacognitive processes were observed between the OCD and PD groups, and the authors suggested that OCD and PD patients might be sharing a common metacognitive profile (Cucchi et al. 2012). These studies suggest that metacognitions may be frequently encountered as dysfunctional cognitions which may cause vulnerability to anxiety as well as be a maintaining factor for anxiety in patients with OCD and/or PD, and that metacognitive beliefs should be targeted in their treatment. However, the literature on metacognitive beliefs and their relationship with PD is relatively underresearched compared to OCD, and further direct comparisons of OCD and PD are needed to elucidate any possible differential metacognitive processes or beliefs in these two diagnostic groups.

As another third wave therapy approach, in ACT, the therapist aims to increase psychological flexibility so that the client manages to achieve a change towards value-driven actions (Hayes et al. 2012). Psychological flexibility may be defined as the capacity to stay in touch with personal internal experiences, to view cognitions as nothing more than simply as cognitions, to have a strong sense of value based direction in life, and to pursue targets which are specifically meaningful for the person himself/herself (Twohig and Lewin 2017). The ACT theory proposes that failing to tolerate negative emotions or thoughts, and responding to such internal experiences in a rigid way may be problematic. Psychological rigidity, therefore, restricts the repertoire of behaviors and any opportunity for external positive reinforcement. In contrast, the ability to participate and interact with negative emotions in a flexible way enables the person to act based on what is meaningful to themselves, and this may increase the flexibility of behaviors (Bluett et al. 2014). For example, the effectiveness of ACT augmented exposure therapy in PD was examined. The results pointed out reductions in agoraphobic cognitions and anxiety sensitivity, and also an increase in mindfulness (Meuret et al. 2012; Twohig et al. 2015). Psychological flexibility was also found to be able to differentiate PD patients from healthy controls, to show treatment sensitivity and to add incremental validity for indices of functioning in addition to demonstrate explained unique variance for some indices of symptomatology in PD (Gloster et al. 2011). In another study, the effectiveness of ACT in treatment resistant PD was demonstrated by a significant decrease in panic symptoms after only four therapy sessions, and the patients continued to improve further in the following sessions (Gloster et al. 2015). There were also case reports on treating anxiety disorders with ACT in the literature, which suggested that the detection and improvement of psychological flexibility in patients with PD and OCD might help facilitate treatment (Sharp 2012). Moreover, in a randomized controlled study of ACT, psychological flexibility was found to be the mediator of long-term outcome for patients with OCD (Twohig et al. 2010). The effectiveness of ACT

in OCD has been demonstrated by various studies (Bluett et al. 2014; Dehlin et al. 2013; Lee et al. 2018; Twohig et al. 2006; Vakili et al. 2015). On the other hand, directly targeting psychological flexibility in OCD did not seem to additionally affect the results of exposure-based treatment (Twohig et al. 2018). Currently, a direct comparison of cognitive flexibility between PD and OCD patients has not been reported in the literature, and the evaluation of cognitive flexibility in the Turkish patient population with PD and OCD is also lacking. Therefore, focusing on this research question is warranted.

Another factor closely related to psychological flexibility is emotional schemas. The EST model proposes that beliefs about emotions may have an effect on a wide range of psychopathological conditions and that negative emotional schemas may result in dysfunctional emotion regulation strategies. According to this model, individuals differ in their beliefs about emotions along 14 dimensions, i.e., acceptance, blame, comprehensibility, consensus with others, duration, emphasis on rationality, expression, guilt, need for control, numbness, relation to higher values, rumination, simplistic view of emotion, and validation (Leahy 2018). In a recent study, psychological flexibility was positively correlated with the emotional schema dimensions of acceptance, comprehension, consensus, control, expression, and higher values, whereas the emotional schema dimensions of blame, duration, guilt, numbness, rationality, rumination, and simplistic views of emotions were negatively correlated with psychological flexibility. Thus, psychologically flexible individuals were more likely to believe that other people were more receptive to their emotions, believed that their emotions made sense, thought that their emotional experiences were clarifying their values, believed they had control over their emotions, normalized their emotions, were more accepting of their emotional experiences, and were more willing to experience and express their emotions (Silberstein et al. 2012). Tirch et al. (2012) investigated the relationship between emotional schemas, psychological flexibility, dispositional mindfulness, and anxiety. Most of the negative emotional schemas were found to be correlated with elevated levels of anxiety. The multiple regression analyses used in their study indicated that the two emotional schemas that were the most highly correlated with anxiety were schemas regarding the loss of control and lasting duration of emotional experiencing (Tirch et al. 2012). The authors suggested that emotional schemas, mindfulness, and psychological flexibility were all highly related to anxiety, that negative emotional schemas and psychological inflexibility together accounted for a great degree of the anxiety, and that each of these processes might be viewed as targets for clinical interventions (Tirch et al. 2012). As can be inferred from these findings, psychological rigidity would be related to beliefs about longer duration and uncontrollability of emotions. In fact, these beliefs might reflect a danger schema, threat detection about emotional experiences, or threat monitoring, all of which are consistent with Barlow's model of exposure to interoceptive stimuli, Beck's model of threat detection, and Wells' MCT model in anxiety disorders (Barlow 2001; Beck and Clark 1997; Wells 2009). Through the EST perspective of psychopathology, individuals with PD might be expected to believe that their emotions are not understandable, will go out of their control, last for a long time, are not experienced by others, and are unacceptable. On the other hand, OCD patients have thought fusion beliefs, responsibility beliefs about the need to neutralize their intrusions, and beliefs about the personal implications and specific meaning of these intrusions (Clark 2004; Wells 2009). These beliefs and cognitive processes present in patients with OCD may also be conceptualized as emotional schemas, which these

patients use to manage their unwanted intrusive cognitions (Leahy 2007a). However, since the EST model has not been developed to reflect disorder-specific conceptualizations, there are no published models for PD or OCD. In a recent study, the authors concluded that individuals activated metacognitive beliefs to the extent of their negative emotional schemas, that there was a strong relationship between negative emotional schemas and metacognitive beliefs, and that individuals with higher negative metacognitive beliefs had significantly higher negative emotional schemas (Leahy et al. 2019). The relationship between metacognitions and emotional schemas was also previously reported in other studies (Batmaz et al. 2014; Ulusoy et al. 2015). Although there are reports on the application of EST to anxiety disorders, including OCD (Leahy 2007a, b), no study on the emotional schemas in PD and OCD has yet been published. Further, to the best of our knowledge, no research comparing the emotional schemas in patients with PD and OCD has been published in the literature.

As succinctly summarized above, metacognitive beliefs, emotional schemas, and cognitive flexibility have all been, to some extent, investigated in patients with OCD or PD. However, given the transdiagnostic nature of these core processes, it would be necessary to demonstrate that they are present across different diagnostic categories. Furthermore, it would also be necessary to make comparisons between OCD and PD patients on these psychological constructs, and any differences or similarities of them between these diagnoses would guide the choice of psychotherapeutic targets during treatment, or help differentially diagnose complex cases where the criteria of the DSM 5 fail to be sufficient (American Psychiatric Association 2013). Also, from a transcultural perspective, studies focusing on common processes for psychopathology in different cultures would serve as an aid to generalize recommendations for treatment in populations with diverse cultural backgrounds, and therefore, testing whether these proposed transdiagnostic processes are equally valid in the Turkish population might add to the literature. On the other hand, metacognitive beliefs, emotional schemas, and cognitive flexibility have not been subject to many studies in the Turkish population, and studies on the association of these processes are also surprisingly lacking. For example, although a study on the role of metacognitive processes and emotional schemas in OCD was conducted in the Turkish population (Ulusoy et al. 2015), no study in PD has yet been published. Studies on emotional schemas and cognitive flexibility in Turkish patients are also grossly underresearched, and more data would be useful for both diagnostic purposes and treatment guidance. Therefore, in the current study, we aimed to investigate the similarities and differences between patients with OCD and PD, and healthy control subjects on their metacognitive beliefs, emotional schemas, and cognitive flexibility. We also aimed to document the relationship between these transdiagnostic processes. We hypothesized that the clinical groups would score higher than the control subjects on their dysfunctional metacognitive beliefs and negative beliefs about emotional schemas, and that they would score lower than the control subjects on their cognitive flexibility. Since this was an exploratory study, no specific hypotheses were put forward regarding the group differences between OCD and PD patients on these processes. We also hypothesized that all transdiagnostic processes would be correlated with each other and that the direction of the correlation would be positive between metacognitive beliefs and emotional schemas, but negative between cognitive flexibility and the others.

## Methods

### Participants

The study population consisted of 160 outpatients (101 women, 63.1%) aged 18 and older [mean (M) age = 35.29 years, standard deviation (SD) = 10.20, range 18–67 years] with a primary diagnosis of OCD or PD according to the criteria of the DSM 5 (American Psychiatric Association 2013), or with no current psychiatric diagnosis (NPC). Two separate groups were formed according to their diagnosis, and the third group was the NPC group. The healthy control group consisted of patients who presented to outpatient departments other than the psychiatry clinic. They were required to score 10 or less on the Beck Depression Inventory (BDI) (Beck et al. 1961), 8 or less on the Beck Anxiety Inventory (BAI) (Beck et al. 1988a), and 80 or more on the Global Assessment of Functioning Scale (GAFS). The patients in the healthy control group were randomly selected, and after their routine clinical visit at their department of presentation, they were briefed about the current study and asked whether they would be willing to participate; the ones who consented were referred to the psychiatry department. None of the participants received any financial support.

The groups did not differ in terms of gender, level of education, socioeconomic status, and medical comorbidity. Patients in the PD group were slightly older than the patients in the OCD group, and there were more married participants in the PD group compared to the other two groups. Participants in the NPC group were more frequently gainfully employed. Participants in the OCD group reported a lower level of perceived social support than the participants in the PD group. Demographic and clinical characteristics of the participants are summarized in Table 1.

### Procedure

All participants were interviewed at the outpatient clinics at two different secondary or tertiary healthcare facilities via a semi-structured diagnostic interview based on DSM 5 criteria (American Psychiatric Association 2013). History of psychiatric disorder was questioned in healthy control group, and we relied on the responses of the participants. The healthy control subjects were not asked about any clinical details about psychiatric disorders. Any healthy control subjects with a current or previous psychiatric diagnosis were excluded from the study. Only participants who consented to the study protocol were eligible for recruitment. Interviewers were experienced psychiatrists specializing in anxiety disorders or OCD. Any participants who failed to meet the primary diagnoses of OCD or PD were excluded from the study. In the current study, any patients who had both OCD and PD diagnoses were excluded from the study. Additionally, any participants with a comorbid psychotic or bipolar disorder, or participants with organic brain disorders or active substance use disorders were also excluded. After the diagnostic interview, the interviewer filled out the demographic and clinical data form, the scales used for the severity ratings of OCD and PD, and the GAFS, and the participants were asked to fill out a series of psychometric questionnaires. The total time required for the completion of the questionnaires ranged from 20 to 40 min. Data collection lasted from January 2017 to June 2017. After having been debriefed about the

**Table 1** Demographic and clinical characteristics of the participants

|   | Control group (N = 52)<br>M/n (SD/%) | OCD group (N = 52)<br>M/n (SD/%) | PD group (N = 56)<br>M/n (SD/%) | Statistics          | p       |
|---|--------------------------------------|----------------------------------|---------------------------------|---------------------|---------|
| Age (years)                                     | 34.58 (10.02)                        | 32.37 (11.06)                    | 38.93 (9.51)                    | $F(2,157) = 5.71$   | 0.004   |
| Sex, female                                     | 30 (57.7)                            | 29 (55.8)                        | 42 (75)                         | $\chi^2(2) = 5.26$  | 0.072   |
| Marital status, married                         | 27 (51.9)                            | 21 (40.4)                        | 41 (73.2)                       | $\chi^2(4) = 18.14$ | 0.006   |
| Level of education (years)                      | 14.10 (3.35)                         | 13.89 (2.35)                     | 14.14 (2.67)                    | $F(2,157) = 0.13$   | 0.881   |
| Employment, gainfully employed                  | 32 (61.5)                            | 18 (34.6)                        | 26 (46.4)                       | $\chi^2(8) = 41.23$ | < 0.001 |
| SES, low  | 16 (30.8)                            | 9 (17.3)                         | 11 (19.6)                       | $\chi^2(4) = 5.53$  | 0.237   |
| Comorbid medical disorder, present              | 8 (15.4)                             | 13 (25)                          | 20 (35.7)                       | $\chi^2(2) = 5.86$  | 0.053   |
| Comorbid psychiatric disorder, present          | N/A                                  | 15 (28.8)                        | 15 (26.8)                       | $\chi^2(1) = 0.14$  | 0.707   |
| Duration of illness (years)                     |                                      | 6.52 (4.53)                      | 5.71 (4.84)                     | $t(158) = 0.89$     | 0.379   |
| Family history of psychiatric disorder, present |                                      | 11 (21.2)                        | 17 (30.4)                       | $\chi^2(1) = 1.19$  | 0.275   |
| Currently on psychiatric medication, yes        |                                      | 14 (26.9)                        | 20 (35.7)                       | $\chi^2(1) = 0.84$  | 0.359   |
| Substance use, yes                              |                                      | 13 (25)                          | 19 (33.9)                       | $\chi^2(1) = 1.03$  | 0.310   |
| Comorbid personality disorder, present          |                                      | 20 (38.5)                        | 23 (41.1)                       | $\chi^2(1) = 0.08$  | 0.782   |

OCD obsessive-compulsive disorder, PD panic disorder, SES socioeconomic status

requirements of the study, written informed consent was obtained from the participants, and the study design was approved by the local ethics committee.

## Psychometric Scales

The participants completed the Turkish versions of the BDI (Beck et al. 1961; Hisli 1989), and the BAI (Beck et al. 1988a; Ulusoy et al. 1998). The revised BDI is a 21-item self-report questionnaire in which each item consists of four statements indicating different levels of severity of a particular symptom experienced over the past week. Scores for all 21 items are summed to yield a single depression score. The internal consistency of the BDI, based on a number of clinical samples, is 0.86 (Beck et al. 1988b). The BAI consists of 21 symptoms that are rated on a 4-point severity scale referring to experience of symptoms over the past week. Scores for the 21 items are summed to yield a single anxiety score. The internal consistency of the BAI over a number of samples has been found to be 0.92 (Beck et al. 1988a). The interviewers used the Turkish versions of the Yale-Brown Obsessive Compulsive Scale (YBOCS) (Goodman et al. 1989a, b; Tek et al. 1995), and the Panic Disorder Severity Scale (PDSS) (Monkul et al. 2004; Shear et al. 2001) to rate the severity of the OCD and PD. The YBOCS and the PDSS were only completed for the OCD and PD groups. The YBOCS is a semi-structured interview including 10 items for the measurement of OCD severity, 5 items pertaining to compulsions, and 5 items to obsessions. Items are rated on a five point Likert scale from 0 (no symptoms) to 4 (extreme symptoms). These items assess time occupied, interference with activities, distress, resistance, and control. The psychometric properties including internal consistency and interrater reliability for the YBOCS have been found to be satisfactory (Goodman et al. 1989a, b). The PDSS is a seven-item measure, rated on a five-point Likert scale. Its application takes 10–15 min. The total score ranges from 0 to 28, and higher scores indicate more severe symptoms (Shear et al. 2001). All of these questionnaires used are the standard research measures accepted for research purposes. They all have frequently been utilized in earlier studies, and they have been reported to demonstrate sound psychometric properties. For the assessment of functioning, the Turkish version of the GAFS (Jones et al. 1995) was used. The GAFS is used to rate how serious a mental illness may be. It measures how much a person's symptoms affect his or her day-to-day life on a scale of 0 to 100. It is designed to help mental health providers understand how well the person can do everyday activities, and the scores of the GAFS reflect the general functioning of the person.

The participants also completed the Turkish versions of the Metacognitions Questionnaire-30 (MCQ-30) (Wells and Cartwright-Hatton 2004; Tosun and Irak 2008), the Leahy Emotional Schema Scale (LESS) (Batmaz and Özdel 2015; Leahy 2002; Yavuz et al. 2011), and the Cognitive Flexibility Inventory (CFI) (Dennis and Vander Wal 2010; Sapmaz and Doğan 2013). The MCQ-30 is a multidimensional instrument for assessing metacognitions, composed of five factors: cognitive confidence, positive beliefs about worry, cognitive self-consciousness, negative beliefs about worry (uncontrollability and danger), and need to control thoughts. Psychometric properties of the MCQ-30 have been well documented suggesting that it is a valid instrument that has already been used in clinical research in several psychiatric disorders. MCQ-30 scores range from 30 to 120 points. Higher scores indicate a more

dysfunctional metacognitive belief (Wells and Cartwright-Hatton 2004). Initial validation studies in English have shown that the MCQ-30 has good to excellent internal consistency ( $\alpha = 0.72\text{--}0.93$ ), and good test–retest reliability ( $r = 0.75$ ). The LESS consists of statements on how a person copes with their emotions, and about their beliefs about their own emotions. It is a Likert-type scale and consists of 50 items. After the statement in each item is read, person ticks the most appropriate choice between 1 (very untrue of me) and 6 (very true of me). According to its psychometric study by Leahy (2002), the scale consists of 14 dimensions each containing 2 to 7 items (Leahy 2002). The CFI is a 20-item self-report scale designed to measure flexibility in terms of understanding and responding to the world. The alternative subscale reflects a person's ability to generate multiple solutions to difficult situations and perceive multiple alternative explanations for events. The control subscale reflects a person's tendency to perceive difficult situations as controllable. Higher scores on this measure indicate greater cognitive flexibility (Dennis and Vander Wal 2010). These scales were used to compare the groups with each other according to the main hypotheses of the study. These scales are each related to a different aspect of the cognitive behavioral theory for psychopathology. The MCQ-30 measures the metacognitive beliefs underlying psychopathology, whereas the LESS is more concerned with the interpretations of the emotional reactions of the individual, and the CFI tends to demonstrate how flexible the thinking pattern of the individual is.

## Statistical Analyses

SPSS for Windows v. 17.0 (Chicago, IL, USA) was used to analyze the data. Descriptive statistics were shown by mean (standard deviation), and by the number of cases (percentage). The significance of the difference of the mean scores of the psychometric scales between the groups was analyzed by analysis of variance (one-way ANOVA), and by Student's *t* test. If a significant difference was detected by the one-way ANOVA, post hoc Tukey HSD test was used to identify the responsible cases. Effect size (ES) indices as eta-squared ( $\eta^2$ ) for one-way ANOVA and as Cohen's *d* for Student's *t* test were also computed. Categorical variables were analyzed by Pearson's  $\chi^2$ . The association between the psychometric scales was evaluated by Pearson's correlation analyses. Values of  $p < 0.05$  were considered as statistically significant.

## Results

### Group Comparisons According to Diagnostic Groups

The groups were compared with each other on scales about the severity of psychopathology, general functioning, metacognitive beliefs, emotional schemas, and cognitive flexibility. The PD group scored significantly higher than both of the other groups on the BAI (medium ES), whereas both of the clinical groups scored significantly higher than the NPC group on the BDI (medium ES), but there were no statistically significant differences between the PD and the OCD groups. As expected, the OCD group scored higher on the YBOCS, and the PD group scored higher on the PDSS (large ESs for both). On the GAFS, the NPC group scored the highest, followed by the PD group, and the OCD group, and all group differences were

**Table 2** Group comparisons according to the severity of psychopathology, functioning, metacognitive beliefs, emotional schemas, and cognitive flexibility ratings

|                          | NPC group (n = 52) | OCD group (n = 52) | PD group (n = 56) | $F(2,157)/t(106)$ | p       | $\eta^2/d$ | Post hoc comparisons |
|--------------------------|--------------------|--------------------|-------------------|-------------------|---------|------------|----------------------|
| PPF                      |                    |                    |                   |                   |         |            |                      |
| BAI                      | 16.25 (1.78)       | 17.45 (12.75)      | 26.47 (14.65)     | 8.50              | < 0.001 | 0.10       | PD > OCD = NPC       |
| BDI                      | 12.35 (8.72)       | 18.89 (11.80)      | 20.11 (10.79)     | 8.31              | < 0.001 | 0.10       | PD = OCD > NPC       |
| YBOCS                    | N/A                | 17.98 (6.45)       | 4.80 (6.61)       | 10.49             | < 0.001 | 2.02       | –                    |
| PDSS                     |                    | 3.91 (3.06)        | 13.62 (4.16)      | – 13.78           | < 0.001 | 2.66       | –                    |
| GAFS                     | 81.35 (3.81)       | 39.34 (4.26)       | 59.16 (3.53)      | 1533.71           | < 0.001 | 1.00       | NPC > PD > OCD       |
| Positive beliefs         | 11.81 (3.15)       | 13.28 (4.31)       | 11.33 (4.54)      | 3.38              | 0.037   | 0.04       | OCD > PD, OCD > NPC  |
| Uncontrollability/danger | 13.38 (4.12)       | 15.79 (5.01)       | 15.47 (4.60)      | 4.34              | 0.015   | 0.05       | PD = OCD > NPC       |
| Cognitive confidence     | 13.31 (2.67)       | 12.34 (4.58)       | 13.56 (4.80)      | 1.30              | 0.276   | 0.02       | –                    |
| Need to control thoughts | 12.75 (3.95)       | 15.92 (4.60)       | 15.65 (3.73)      | 9.66              | < 0.001 | 0.11       | PD = OCD > NPC       |
| Cognitive consciousness  | 14.15 (3.20)       | 15.53 (3.83)       | 14.98 (3.76)      | 1.93              | 0.149   | 0.02       | –                    |
| MCQ-30                   | 65.06 (12.18)      | 72.62 (17.44)      | 70.98 (15.78)     | 3.54              | 0.031   | 0.04       | PD = OCD > NPC       |
| ES                       |                    |                    |                   |                   |         |            |                      |
| Uncontrollability        | 12.25 (5.77)       | 18.45 (7.26)       | 16.58 (6.77)      | 12.06             | < 0.001 | 0.13       | PD = OCD > NPC       |
| Weakness                 | 12.23 (3.58)       | 14.36 (4.41)       | 12.65 (4.53)      | 3.80              | 0.025   | 0.05       | OCD > NPC            |
| Comprehensibility        | 7.83 (3.75)        | 9.81 (4.74)        | 10.24 (4.22)      | 4.83              | 0.009   | 0.01       | PD = OCD > NPC       |
| Avoidance                | 20.31 (6.57)       | 17.64 (4.86)       | 17.25 (4.53)      | 5.05              | 0.007   | 0.06       | NPC > PD = OCD       |
| Rationality              | 12.81 (3.58)       | 12.77 (3.53)       | 13.15 (3.69)      | 0.18              | 0.838   | 0.002      | –                    |
| Acceptance               | 18.40 (4.82)       | 19.96 (4.49)       | 18.71 (4.52)      | 1.70              | 0.187   | 0.02       | –                    |
| Rumination               | 13.10 (4.65)       | 16.83 (4.36)       | 17.29 (4.66)      | 13.45             | < 0.001 | 0.15       | PD = OCD > NPC       |
| Dissimilarity            | 12.52 (4.44)       | 16.09 (4.61)       | 15.38 (3.97)      | 9.97              | < 0.001 | 0.11       | PD = OCD > NPC       |
| Denial                   | 10.58 (3.27)       | 11.21 (3.38)       | 11.58 (3.63)      | 1.16              | 0.315   | 0.02       | –                    |
| Duration                 | 11.65 (17.97)      | 10.68 (3.04)       | 10.29 (3.53)      | 0.23              | 0.792   | 0.003      | –                    |
| Validation               | 6.37 (2.07)        | 6.87 (2.68)        | 6.58 (2.52)       | 0.56              | 0.572   | 0.01       | –                    |
| Consensus                | 5.15 (2.36)        | 5.51 (2.71)        | 4.84 (2.69)       | 0.91              | 0.405   | 0.01       | –                    |

Table 2 (continued)

|               | NPC group (n = 52) | OCD group (n = 52) | PD group (n = 56) | $F(2,157) / (106)$ | p      | $\eta^2/d$ | Post hoc comparisons |
|---------------|--------------------|--------------------|-------------------|--------------------|--------|------------|----------------------|
| Dangerousness | 4.69 (2.25)        | 7.19 (3.22)        | 8.35 (3.03)       | 22.47              | <0.001 | 0.22       | PD = OCD > NPC       |
| Guilt         | 7.56 (4.01)        | 9.15 (3.42)        | 9.44 (3.47)       | 4.09               | 0.019  | 0.05       | PD = OCD > NPC       |
| LESS          | 152.56 (32.41)     | 175.19 (24.47)     | 172.56 (24.80)    | 10.72              | <0.001 | 0.12       | PD = OCD > NPC       |
| CFI           | 78.35 (9.54)       | 64.70 (16.13)      | 63.98 (13.74)     | 19.11              | <0.001 | 0.20       | NPC > PD = OCD       |

Results presented as mean (standard deviation)

NPC non-psychiatric control, OCD obsessive-compulsive disorder, PD panic disorder, PPF psychopathology and functioning, MCB metacognitive beliefs, ES emotional schemas, CF cognitive flexibility, BAI Beck Anxiety Inventory, BDI Beck Depression Inventory, YBOCS Yale-Brown Obsessive-Compulsive Scale, PDSS Panic Disorder Severity Scale, GAFS Global Assessment of Functioning Scale, MCQ-30 Metacognitions Questionnaire-30, LESS Leary Emotional Schema Scale, CF cognitive flexibility, CFI Cognitive Flexibility Inventory, N/A not applicable

statistically significant (large ES). Regarding the metacognitive beliefs, the clinical groups scored higher than the NPC group on the scores of the uncontrollability and danger (small ES) and the need to control thoughts subscales (medium ES), and on the total score of the MCQ-30 (small ES). The OCD group also scored higher than the other two groups on the positive beliefs about worry subscale (small ES). On the uncontrollability (medium ES), comprehensibility (small ES), rumination (medium ES), dissimilarity (medium ES), dangerousness (medium ES), and guilt (small ES) dimensions of the LESS, and on the total score of the LESS (medium ES), the clinical groups scored significantly higher than the NPC group. The NPC group scored higher than the clinical groups on the avoidance dimension (small ES). The OCD group scored higher than the NPC group on the weakness dimension (small ES). The NPC group obtained higher scores than the clinical groups on the CFI score (large ES). The results of the group comparisons are presented in Table 2.

### **Intercorrelations Between the Psychometric Scales According to Diagnostic Groups**

In the total sample, the MCQ-30 and LESS were moderately and positively correlated with each other ( $p < 0.01$ ), and the MCQ-30 and the LESS were weakly and negatively correlated with the CFI ( $p < 0.01$ ). In the OCD group, the MCQ-30 and the LESS were moderately and positively correlated with each other ( $p < 0.01$ ), and the MCQ-30 (moderate correlation) and the LESS (weak correlation) were negatively correlated with the CFI (both  $p$  values  $< 0.01$ ). In the PD group, the MCQ-30 was moderately and positively correlated with the LESS ( $p < 0.01$ ), and the MCQ-30 and the LESS were weakly and negatively correlated with the CFI ( $p < 0.05$ ). In the healthy control group, the MCQ-30 was moderately and positively correlated with the LESS ( $p < 0.01$ ), and the MCQ-30 and the LESS were weakly and negatively correlated with the CFI (both  $p$  values  $< 0.05$ ). These results are presented in Table 3.

## **Discussion**

The present study aimed to investigate the differences in metacognitive beliefs, emotional schemas, and cognitive flexibility in OCD and PD groups with healthy controls. Our results showed that dysfunctional metacognitive beliefs and negative emotional schemas were mostly elevated in patients with OCD and PD with only little between clinical group differences when compared with the NPC. In addition, the healthy control subjects showed higher cognitive flexibility, as expected. These results give support to the transdiagnostic features of the investigated psychological processes, and they also confirm the a priori hypotheses to a great extent. Further, results of the correlational analyses between the psychometric scales confirmed the hypotheses of the study, as predicted.

### **Dysfunctional Metacognitive Beliefs**

The metacognitive model of OCD differentiates between dysfunctional beliefs about the self and the world, such as inflated responsibility, perfectionism, need for certainty, intolerance of uncertainty, and heightened risk for threats, and metacognitive beliefs about one's thoughts, such as the significance, power, dangerousness, or special meaning of, and the need to control, thoughts (Wells 2009). MCT proposes that

**Table 3** Intercorrelations between the psychometric scales according to diagnostic groups

|      | Total sample |          |          | OCD group |         |         | PD group |         |         | NPC group |         |         |
|------|--------------|----------|----------|-----------|---------|---------|----------|---------|---------|-----------|---------|---------|
|      | MCQ-30       | LESS     | CFI      | MCQ-30    | LESS    | CFI     | MCQ-30   | LESS    | CFI     | MCQ-30    | LESS    | CFI     |
|      | MCQ-30       | 1        | 0.369**  | -0.215*** | 1       | 0.504** | -0.311** | 1       | 0.301** | -0.224*   | 1       | 0.315** |
| LESS | 0.369**      | 1        | -0.206** | 0.504**   | 1       | -0.268* | 0.301**  | 1       | -0.256* | 0.315**   | 1       | -0.216* |
| CFI  | -0.215**     | -0.206** | 1        | -0.311**  | -0.268* | 1       | -0.224*  | -0.256* | 1       | -0.284*   | -0.216* | 1       |

*OCD* obsessive-compulsive disorder, *PD* panic disorder, *NPC* non-psychiatric control, *MCQ-30* Metacognitions Questionnaire-30, *LESS* Leahy Emotional Schema Scale, *CFI* Cognitive Flexibility Inventory

\* $p < 0.05$ ; \*\* $p < 0.01$

metacognitive beliefs explain a higher proportion of variance than dysfunctional beliefs for the development and maintenance of OCD. According to the metacognitive model of OCD, metacognitive beliefs might induce dysfunctional appraisals of internal experiences and therefore lead to anxiety. In addition, individuals with OCD tend to engage in dysfunctional and backfiring coping strategies such as repetitive negative thinking, thought suppression, threat monitoring, avoidance, and ritualistic behaviors (Myers et al. 2009). Previous research demonstrated that patients with OCD had negative beliefs about worry, felt a need to control their thoughts, and had a lack of confidence in their cognitive functions (Moritz et al. 2010). Similarly, in the current study, negative beliefs about worry were higher in the OCD group than both the PD and NPC groups, albeit not statistically significant. Myers and Wells previously reported that higher levels of negative beliefs about worry concerning its uncontrollability and danger, and beliefs about the need to control thoughts were the most associated metacognitive beliefs with OCD symptoms (Myers and Wells 2005). Moreover, beliefs about the uncontrollability and danger of worry most successfully differentiated patients with OCD from healthy subjects (Hermans et al. 2003). In a different study, the OCD group scored higher on negative beliefs about worry, cognitive confidence, need to control thoughts, and cognitive consciousness than healthy controls. In the same study, the PD sample also scored significantly higher on the negative beliefs about worry, need to control thoughts, and cognitive consciousness than the control group. Patients with OCD differed significantly from the PD group only on the negative beliefs about worry concerning uncontrollability and danger dimension, while in our study, there were no differences between the OCD and PD groups (Cucchi et al. 2012). Regarding studies undertaken in patients with PD, Morrison and Wells showed that patients with PD had higher levels of dysfunctional metacognitions when compared with a control group. Patients with PD scored higher on the levels of negative beliefs about uncontrollability and danger of worry, and had more dysfunctional beliefs about the need to control their thoughts, which was also reported in our study (Morrison and Wells 2003). Thus, although in the current study, there were no differences on uncontrollability/danger beliefs, and on need to control thoughts between the PD and OCD groups, our results were to a great extent consistent with the metacognitive model of OCD and PD, and these results suggest that metacognitions may be an important factor contributing to the dysfunctional beliefs characterizing both OCD and PD symptoms, and that they should be targeted as a priority in their therapy. The results also provide support for a transdiagnostic approach using MCT to patients with OCD and PD, and also add to the relatively underreported studies in the literature on the comparison of metacognitive beliefs between OCD and PD patients. The metacognitive model of PD has not been as extensively studied as the model of OCD, and the results might also help with the details of the metacognitive model of PD and help guide prepare treatment protocols using MCT principles.

### **Negative Emotional Schemas**

In the relatively scant literature on emotional schemas, the study by Tirsch et al. (2012) focused on the relationship between emotional schemas, psychological flexibility, and anxiety. They reported that schemas regarding loss of control and lasting duration of emotional experience highly correlated with anxiety (Tirsch et al. 2012). In the current

study, the emotional schema dimensions of uncontrollability, comprehensibility, rumination, dissimilarity, dangerousness, and guilt were more frequently used in both the OCD and PD groups than the NPC group. This study seems to be the first reporting specifically on emotional schemas in OCD and PD. Thus, the current results provide additional data on the emotional schemas of OCD and PD patients. Moreover, the EST model, which is to some extent, based on the metacognitive model of psychopathology, therefore, in its transdiagnostic approach may be an alternative way for psychotherapists to adopt while providing transdiagnostic treatment. The results suggest that similarities between the diagnostic categories of OCD and PD, rather than their differences, might explain the differentiating features of anxiety-related psychopathology from healthy controls. Therefore, EST as a transdiagnostic approach may be a suitable psychotherapy option to offer to patients with anxiety-related presentations irrespective of their primary diagnoses.

### **Cognitive Flexibility**

Cognitive flexibility was also investigated in the current study. Cognitive flexibility has been reported to mediate the relationship between intolerance of uncertainty and safety signal responding (Lieberman et al. 2017). In patients with OCD, experiential avoidance and distress tolerance have been demonstrated to contribute to obsessive-compulsive symptoms, which results in difficulty managing unwanted intrusive thoughts, emotions, and other internal affective experiences (Blakey et al. 2016). All of these psychological processes are known to be related to cognitive flexibility. In the current study, both the OCD and PD groups demonstrated lower levels of cognitive flexibility than the NPC group, which is in line with the general ACT model of psychopathology. The ACT model suggests that a rigid way of interpreting internal experiences, and failing to disengage from mental and emotional processing may cause psychological distress. If the person is preoccupied with his/her distress, then a value-based behavioral response may be delayed (Hayes et al. 2012). Consequently, the current study is also in line with the ACT model of psychopathology, and the transdiagnostic process of cognitive flexibility seems to be a suitable target for psychotherapy. The current study has also contributed to the literature by specifically comparing OCD and PD patients on their levels of cognitive flexibility. More research on cognitive flexibility might clarify how it needs to be approached by therapists in patients with high levels of anxiety or worry. MCT as well as ACT might reduce the repetitive thinking style observed in such patients, and enabling them to distance from prolonged mental processing may be an alternative way towards psychological well-being.

### **Correlational Analyses**

The intercorrelations between the psychometric scales have confirmed the predicted hypotheses. Both the clinical groups and the healthy control subjects demonstrated significant correlations in the expected directions, and these correlations ranged between weak to moderate levels. These results suggest that although these scales correspond to a shared underlying and transdiagnostic process, they actually measure different aspects of psychopathology. Therefore, a transdiagnostic approach might be appropriate for patients with anxiety-related disorders; however, targeting these

processes may need to be theory guided, and the specific psychotherapy approach may direct the clinician to focus on the selected process.

### **Possible Clinical Implications**

The results of the current study have some important clinical implications. First, this study is one of the few studies specifically focusing on the differences between OCD and PD on metacognitive beliefs, emotional schemas, and cognitive flexibility. Any differences would help in differential diagnosis and individual conceptualization of these conditions. Yet, there were no major specific differences between the patients with OCD and PD, which supports the idea that a transdiagnostic approach to therapy, e.g., ACT or MCT, might be effective enough in clinical groups with a common underlying symptomatology, such as anxiety. Second, this study sought for an answer to the question whether these psychological concepts differentiated clinical groups with higher levels of anxiety from non-clinical controls. Since differences observed between the clinical groups and healthy controls might point out to targets to be addressed in psychotherapy, these results may help therapists to selectively spend more time on the more frequently encountered problem areas. Third, this study adds to the literature on third wave CBT approaches in specific diagnoses and is also most probably to be the first one to examine the emotional schemas and cognitive flexibility in patients with OCD and PD. Fourth, this study adds to the literature undertaken in Turkish patients, and this might help to generalize the utility of different third wave CBT approaches in a non-Western culture.

### **Limitations**

The study has several limitations. First, this study relied on a semi-structured clinical interview for diagnosis. Some participants with comorbid diagnoses, e.g., depressive disorders, might have an impact on the results found. Personality disorders were also not screened at the initial assessment, and this might also have influenced the results. Second, the participants completed only self-report measures, which were the main outcome measures of the study. Third, this was a cross-sectionally designed study, and no follow-up or specific psychotherapeutic intervention was offered to the participants. If the participants had been enrolled in a specific therapy, a more thorough evaluation of their cognitive profile would have been present for analysis. Fourth, some of the participants were already receiving treatment, mostly psychopharmacological, and this may have affected their responses to the questionnaires. Fifth, cultural differences may limit the generalizability of the findings to other parts of the world. Sixth, although the main research question was about the between-group differences on patients with OCD and PD, which are two distinct diagnostic categories according to the DSM 5 (American Psychiatric Association 2013), the results need to be replicated in patients with other anxiety disorders or other diagnostic categories.

### **Conclusion**

In conclusion, the present study indicates that patients with PD and OCD have to some extent similar metacognitive beliefs, emotional schemas, and cognitive flexibility.

Focusing on the psychological concepts that differentiate patients with OCD and PD from healthy controls might help identify potential targets for psychotherapy. A transdiagnostic approach might be useful to alleviate symptoms of anxiety across different diagnostic categories.

**Compliance with Ethical Standards** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee, and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants involved in the study.

**Conflict of Interest** The authors declare that they have no conflicts of interest.

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