

## Metacognitive Beliefs and Their Relation with Symptoms in Obsessive-Compulsive Disorder

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### ABSTRACT

**Introduction:** Metacognitive constructs have shown promise in explaining the symptoms of Obsessive-Compulsive Disorder (OCD). Few studies have examined the role of metacognitions in symptom dimensions of OCD, despite mounting clinical, neuropsychological and imaging evidence for the distinctiveness of these dimensions.

**Methods:** Metacognitions were assessed using the Metacognitions Questionnaire (MCQ-30) in 51 participants with DSM IV OCD and 46 healthy controls. The Maudsley Obsessional Compulsive Inventory (MOCI) was used to quantify symptom dimensions, along with the Hamilton Anxiety Rating Scale (HAM-A) for anxiety, and Hamilton Depression Rating Scale (HAM-D) for depression.

**Results:** Individuals with OCD differed from healthy controls on beliefs of uncontrollability and danger when depression and anxiety

were controlled for. Correlations between metacognitive beliefs and obsessive-compulsive symptom dimensions were largely similar across the OCD and healthy control groups. Hierarchical regression showed that *need to control thoughts* contributed to checking, cleaning and rumination symptoms; *cognitive self-consciousness* to symptoms of slowness; *uncontrollability and danger* to doubt symptoms; *positive beliefs* to checking symptoms.

**Conclusions:** Specific associations between metacognitive variables and the different symptom dimensions of OCD are evident, however, severity of anxiety and depression also contribute to these associations.

**Keywords:** Metacognitions, obsessive-compulsive disorder, symptom dimensions, symptom subtypes, checking, cleaning

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### INTRODUCTION

Obsessive compulsive disorder (OCD) is characterized by obsessions, which are egodystonic and unwanted thoughts or impulses, and compulsions, which are repetitive behaviors or mental acts (1). Metacognition refers to the psychological structures, knowledge, events, and processes that are involved in the control, modification, and interpretation of thinking (2). Given the growing focus on thoughts in OCD, it has been proposed that dysfunctional appraisals of intrusive thoughts have an important role in the etiology and maintenance of obsessions and compulsions (3). Cognitive theories have varied in the emphases placed on the role of various aspects of beliefs about thoughts. Wells' s metacognitive model of OCD (3) emphasizes beliefs about the importance and meaning of thoughts, the need to control thoughts, and the need to perform rituals to prevent dreaded consequences. The metacognitions that are thought to be specific to OCD are thought fusion beliefs, beliefs about rituals, and stop signals.

Metacognitions that are not specific to any psychiatric disorder can be called "generic metacognitions." Generic metacognitions are general metacognitions that can be seen both in OCD and in other psychiatric disorders. These metacognitions include beliefs about the usefulness of worry, increased focus on one's thought processes, reduced cognitive confidence, and beliefs about the uncontrollability and danger of thoughts and need to control thoughts (4). Cognitive interventions focused on metacognitive beliefs have shown promise in the treatment of OCD (2). However, one of the challenges faced by clinicians over the years has been that OCD is a heterogeneous condition, and an intervention which is successful for one person may not be suitable for another symptom presentation. Evidence has been steadily accumulating to support the distinctiveness of symptom dimensions within OCD with regard to clinical correlates (5) and neuropsychological (6) and neuroimaging findings (7). While a few studies have investigated OCD-

specific metacognitions, including thought fusion beliefs, beliefs about rituals, and internal stop signals (8), generic metacognitive beliefs may also be useful in understanding the processes involved in the various symptom dimensions of OCD. It is expected that metacognitive processes, including obsessive-compulsive (O-C) beliefs, will contribute differentially to the symptom dimensions of OCD. Such an understanding is anticipated to be useful in improving the effectiveness of individualized cognitive-behavioral interventions for different symptom presentations in OCD.

Many studies investigating the relationship between metacognition and obsessive symptoms in OCD have used non-clinical samples (3, 9), which are hypothesized to be analogous to OCD samples in that worry and obsessions are normally occurring phenomena; however, the need to study clinical samples has been emphasized (9). There is some evidence that, in comparison to healthy individuals, individuals with OCD are highly aware of their thoughts (10) and believe that they cannot control some thoughts, which poses a danger (11).

A handful of studies have focused on relationships between metacognitive beliefs and O-C symptom dimensions of OCD patients. Although two of these studies have indicated that metacognitive beliefs are related to the severity of general symptoms (11), one study indicated no relationship (8). Pazvantoglu et al. studied these relationships, using the Metacognition Questionnaire-30 scale to evaluate generic metacognitions and the Maudsley Obsessional Compulsive Inventory to evaluate the dimensions of O-C symptoms. They reported correlations between doubting and *all subscales of the Metacognition Questionnaire-30 scale*: checking, slowness, rumination, and uncontrollability and danger; and checking, slowness, rumination, doubt, and *cognitive self-consciousness*. However, the effects of age, gender, and symptoms of depression and anxiety related to metacognitions had not been controlled. (12).

There is some evidence suggesting that there may be a greater dysfunction in metacognitive beliefs in females than in males, and in younger as compared to older individuals (13). Because metacognitive beliefs are also known to be affected by anxiety and depression in general (3, 14), it would be important to control for these confounding factors as well.

In this context, this study focused on investigating the relationship between metacognitive constructs and the various symptom dimensions of OCD and also on investigating differences and similarities in metacognitions related to O-C symptom dimensions between individuals with OCD and healthy controls. The hypothesis of this study was to find a relationship between metacognitive beliefs and O-C symptoms in both groups after controlling the confounding effects.

## METHOD

### Participants

The present study included 51 individuals with OCD and 46 healthy controls aged between 18 and 59 years. Approval from the Pamukkale University Medical Faculty Ethics Committee was obtained before the study, and the study was carried out in accordance with the Declaration of Helsinki. Written informed consent was obtained from patients and healthy controls.

Consecutive patients with a diagnosis of OCD who were referred to, or followed at, the Anxiety Disorders outpatient clinic formed the clinical group. Patients with an intellectual disability, significant neurological or medical disorder, psychotic and/or bipolar disorder, or a history of alcohol or substance abuse or dependence were excluded from the study. The control group consisted of age-, gender-, and education level-

matched hospital staff or their relatives who had no psychopathology as determined by the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (SCID).

### Interview and Assessment Tool

Sociodemographic and clinical characteristics of the participants were recorded through psychiatric interviews. The SCID (15) was administered to all participants to diagnose OCD and other psychiatric disorders. O-C symptoms were assessed by category on the Maudsley Obsessional Compulsive Inventory (MOCI) (16) and the severity of these symptoms in individuals with OCD was assessed using the Yale-Brown Obsessive Compulsive Scale (Y-BOCS) (17, 18). The Hamilton Depression Rating Scale (HAM-D) (19) and Hamilton Anxiety Rating Scale (HAM-A) (20) were used with all participants to assess the severity of depression and anxiety symptoms. Thereafter, the Metacognitions Questionnaire (MCQ) was administered. An experienced psychiatrist performed the interviews and applied the assessment tools.

### *The Structured Clinical Interview for DSM-IV Axis I Disorders/ Clinical Version (SCID-I/CV)*

The SCID is a structured interview tool for diagnosis of Axis I mental disorders according to the DSM-IV (15). This tool has been adapted and translated into Turkish and is deemed to have satisfactory psychometric properties (21).

### *Maudsley Obsessional Compulsive Inventory*

This inventory is a 30-item patient-rated scale to assess the presence and extent of O-C symptoms (16). The original scale includes checking, cleaning, slowness, and doubting subscales. While the original MOCI contains two items on rumination, the Turkish version (22) includes seven additional rumination items adapted from the Minnesota Multiphasic Personality Inventory.

### *Yale-Brown Obsessive Compulsive Scale (Y-BOCS)*

This scale is a clinician-rated scale to assess the severity of O-C symptoms (17, 18). The validity and reliability of the Turkish version have been established (23).

### *Hamilton Depression Rating Scale (HAM-D)*

This is a clinician-rated scale to measure the severity of depressive symptoms (19) with satisfactory psychometric properties for the Turkish version (24).

### *Hamilton Anxiety Rating Scale (HAM-A)*

The HAM-A is a clinician-rated measure of somatic and psychic anxiety symptoms (20). The interrater reliability coefficient of the Turkish version is reported as 0.94 (25).

### *Metacognitions Questionnaire (MCQ-30)*

The MCQ (26) is a self-report assessing metacognitive beliefs, with higher scores indicating stronger beliefs about the negative consequences of one's thoughts. The MCQ has five subscales: positive beliefs about worry (e.g., "worrying helps me cope"), *cognitive confidence* (e.g., "I do not trust my memory"), *uncontrollability and danger* (e.g., "my worrying could make me go mad"), *cognitive self-consciousness* (e.g., "I am constantly aware of my thinking"), and *need to control thoughts* (e.g., "if I did not control a worrying thought and then it happened, it would be my fault"). Validity and reliability of the Turkish version have been established (27).

## Statistical Analysis

The Statistical Package for the Social Sciences (SPSS, Inc., Chicago, IL, USA) program, version 15.0 for Windows, was used for the statistical analyses. Independent two-group comparisons for numerical variables were performed by t-test, whereas chi-square test was used for categorical variables. Adjustment was performed using two-way analysis of covariance (ANCOVA) test to control the effects of depression and anxiety in the subscales of MCQ-30. Although we did not use a strict Bonferroni correction, a conservative p value of  $p \leq 0.01$  was set for univariate analyses to reduce the risk of Type I errors. Hierarchical regression analysis was used to determine the contribution of metacognitive variables to the various symptom dimensions. In order to determine the factors that contribute to each O-C symptom dimension in the OCD group, a hierarchical regression analysis (backward) was performed, including age, gender, HAM-D and HAM-A scores in the first step, and MCQ subscales (*positive beliefs* about worry, *cognitive confidence*, *uncontrollability and danger*, *cognitive self-consciousness*, and *need to control thoughts*) in the second step. In this way, the study was aimed to evaluate the relationship between O-C symptoms and MCQ-30 subscale scores, which were studied after controlling for the effects of age, gender, symptoms of depression and anxiety, and other MCQ-30 subtests.

## RESULTS

We calculated that when at least 80 samples (40 for each group) were included in the study, the result would be 95% power with 95% confidence from the results obtained from the reference study (12) for the effect size “ $d=0.748$ .” We included 51 patients and 46 healthy control subjects. For the MCQ-30 total results, we reached 99% power with 95% confidence (for an effect size of “ $d=0.81$ ”).

There were no differences between the OCD and control groups regarding age ( $33.52 \pm 10.67$  and  $33.74 \pm 10.04$ ,  $t=-0.848$ ,  $p=0.374$ ), male/female distribution (20/31 and 19/27,  $\chi^2=0.044$ ,  $p=0.834$ ), and years of education ( $11.11 \pm 3.54$  and  $12.00 \pm 4.13$ ,  $t=1.132$ ,  $p=0.092$ ). The OCD group had significantly higher scores than the control group (all  $p < 0.001$ ) on HAM-D ( $7.23 \pm 4.07$  and  $1.71 \pm 1.77$ , respectively), HAM-A ( $7.43 \pm 5.28$  and  $1.91 \pm 2.06$ ) and total MOCI ( $23.58 \pm 9.31$  and  $8.41 \pm 6.50$ ). In the OCD group, the mean Y-BOCS total scores were  $17.81 \pm 8.27$  (obsession  $9.32 \pm 4.54$ , compulsion  $8.48 \pm 3.99$ ). Eight of the patients were drug-free, while 17 were taking selective serotonin reuptake inhibitors (SSRIs), two were taking clomipramine, and one was taking venlafaxine. Also, some patients were on SSRI + second generation antipsychotics ( $n=20$ ) and clomipramine + second generation antipsychotics ( $n=3$ ).

**Table 1.** Scores of the Metacognitions Questionnaire-30 in the study groups

|                              | Control Group<br>(n=46) | OCD Group<br>(n=51)  | t      | df | p      | Controlling for HAM-D and<br>HAM-A (ANCOVA) |    |       |
|------------------------------|-------------------------|----------------------|--------|----|--------|---------------------------------------------|----|-------|
|                              |                         |                      |        |    |        | F                                           | df | p     |
|                              | Mean±SD (Range)         | Mean±SD (Range)      |        |    |        |                                             |    |       |
| Positive beliefs             | 12.35±4.50 (6-21)       | 12.41±4.80 (6-24)    | -0.067 | 95 | 0.946  | 1.347                                       | 1  | 0.249 |
| Uncontrollability and danger | 10.87±3.89 (5-21)       | 15.98±4.31 (6-24)    | -6.098 | 95 | <0.001 | 5.941                                       | 1  | 0.017 |
| Cognitive confidence         | 12.59±4.80 (6-24)       | 14.88±5.27 (6-24)    | -2.234 | 95 | 0.028  | 0.070                                       | 1  | 0.792 |
| Need to control thoughts     | 11.78±4.79 (6-23)       | 16.98±5.10 (6-24)    | -5.152 | 95 | <0.001 | 2.971                                       | 1  | 0.088 |
| Cognitive self-consciousness | 16.35±4.87 (7-27)       | 17.66±4.45 (5-24)    | -1.392 | 95 | 0.167  | 0.548                                       | 1  | 0.461 |
| Total                        | 63.93±17.85(33-94)      | 77.98±16.67 (34-106) | -4.00  | 95 | <0.001 | 0.393                                       | 1  | 0.532 |

OCD, obsessive-compulsive disorder; HAM-D, the Hamilton Depression Rating Scale; HAM-A, the Hamilton Anxiety Rating Scale; ANCOVA, analysis of covariance.

**Table 2.** Correlations of the Metacognitions Questionnaire with the symptom dimensions

|                              | MOCI     |         |          |         |          |         |          |         |            |         |         |         | YBOCS  |
|------------------------------|----------|---------|----------|---------|----------|---------|----------|---------|------------|---------|---------|---------|--------|
|                              | Checking |         | Cleaning |         | Slowness |         | Doubting |         | Rumination |         | Total   |         | Total  |
| MCQ                          | Control  | OCD     | Control  | OCD     | Control  | OCD     | Control  | OCD     | Control    | OCD     | Control | OCD     | OCD    |
| Positive beliefs             | 0.310    | 0.163   | 0.217    | 0.117   | 0.243    | 0.195   | 0.250    | 0.165   | 0.412*     | 0.194   | 0.393*  | 0.200   | -0.205 |
| Uncontrollability and danger | 0.267    | 0.236   | 0.370    | 0.403*  | 0.441*   | 0.454** | 0.375*   | 0.529** | 0.590**    | 0.620** | 0.576** | 0.594** | 0.163  |
| Cognitive confidence         | 0.218    | 0.283*  | 0.145    | 0.246   | 0.221    | 0.152   | 0.009    | 0.228   | 0.188      | 0.125   | 0.171   | 0.175   | 0.236  |
| Need to control thoughts     | 0.386*   | 0.138   | 0.420*   | 0.451** | 0.338    | 0.499** | 0.407*   | 0.577** | 0.708**    | 0.686** | 0.614** | 0.678** | 0.283  |
| Cognitive self-consciousness | 0.358    | 0.181   | 0.430*   | 0.287   | 0.302    | 0.568** | 0.329    | 0.529** | 0.535**    | 0.614** | 0.556** | 0.597** | 0.138  |
| MCQ-Total                    | 0.392*   | 0.525** | 0.405*   | 0.462** | 0.391*   | 0.546** | 0.347    | 0.604** | 0.607**    | 0.613** | 0.572** | 0.649** | 0.181  |

OCD, Obsessive-Compulsive Disorder; MOCI, Maudsley Obsessional Compulsive Inventory; YBOCS, Yale-Brown Obsessive Compulsive Scale; MCQ, Metacognitions Questionnaire.

\* $p < 0.01$ , \*\* $p < 0.001$

**Table 3.** Hierarchical regression analyses in OCD group (dependent variables were MOCI subscales, and predictors were age, gender, HAM-D and HAM-A scores in the first step, and MCQ subscales in second step).

|                              | B           | SE    | Beta   | t      | p      |
|------------------------------|-------------|-------|--------|--------|--------|
| <b>Checking</b>              | $R^2=0.286$ |       |        |        |        |
| Constant                     | -0.541      | 1.146 | -      | -0.472 | 0.639  |
| Positive beliefs             | 0.157       | 0.060 | 0.325  | 2.630  | 0.011  |
| Need to control thoughts     | 0.171       | 0.056 | 0.377  | 3.054  | 0.004  |
| <b>Cleaning</b>              | $R^2=0.327$ |       |        |        |        |
| Constant                     | 0.580       | 1.441 | -      | 0.403  | 0.689  |
| HAM-A Total                  | 0.164       | 0.057 | 0.361  | 2.875  | 0.006  |
| Age                          | 0.052       | 0.027 | 0.234  | 1.932  | 0.059  |
| Need to control thoughts     | 0.143       | 0.059 | 0.305  | 2.401  | 0.020  |
| <b>Slowness</b>              | $R^2=0.229$ |       |        |        |        |
| Constant                     | -0.236      | 0.965 | -      | -0.244 | 0.808  |
| Cognitive self consciousness | 0.252       | 0.053 | 0.478  | 3.811  | 0.000  |
| <b>Doubt</b>                 | $R^2=0.347$ |       |        |        |        |
| Constant                     | 2.785       | 1.047 | -      | 2.659  | 0.011  |
| Gender                       | -0.933      | 0.416 | -0.265 | -2.244 | -0.030 |
| Uncontrollability and danger | 0.194       | 0.047 | 0.484  | 4.089  | 0.000  |
| <b>Rumination</b>            | $R^2=0.522$ |       |        |        |        |
| Constant                     | 1.506       | 1.449 | -      | 1.039  | 0.304  |
| HAM-D                        | 0.211       | 0.075 | 0.320  | 2.817  | 0.007  |
| Gender                       | -1.465      | 0.564 | -0.268 | -2.597 | 0.013  |
| Positive beliefs             | 0.099       | 0.058 | 0.176  | 1.700  | 0.096  |
| Need to control thoughts     | 0.190       | 0.060 | 0.361  | 3.161  | 0.003  |

MOCI, Maudsley Obsessional Compulsive Inventory; HAM-A, the Hamilton Anxiety Rating Scale; HAM-D, the Hamilton Depression Rating Scale.

According to the scores on the MCQ-30, the *MCQ-uncontrollability and danger*, *cognitive confidence*, *-need to control thoughts*, and *-total scores* were significantly higher in the OCD group than in the control group (Table 1). When the total scores of HAM-D and HAM-A scales were used as covariates, the *MCQ-uncontrollability and danger* score was significantly higher in the OCD group. The correlations of MCQ scores with the MOCI and Y-BOCS scores are shown in Table 2. Although there were some differences, the pattern of correlations in the OCD group was similar to the control group. Hierarchical regression analysis indicated relationships between checking and positive *beliefs* and *need to control thoughts*; cleaning and need to control thoughts; slowness and *cognitive self-consciousness*; doubt and *uncontrollability and danger*; and rumination and *need to control thoughts* (Table 3).

## DISCUSSION

The present study compared OCD patients with healthy controls in terms of metacognitive beliefs and investigated the relation of dysfunctional metacognitive beliefs to O-C symptoms.

Previous studies have viewed metacognitions in healthy controls as analogous to those in individuals with OCD (9). Current results support this conceptualization; nevertheless, individuals with OCD in the present study differed from controls mainly in metacognitive beliefs relating

to uncontrollability and danger. This subscale has been demonstrated to be the most successful in differentiating individuals with OCD from controls and non-anxious patients from controls (4), although there were no significant differences in comparison with a panic disorder group (11). In this study, the beliefs in *uncontrollability and danger* were associated with doubt symptoms. Likewise, metacognitions relating to *uncontrollability and danger* have been found to be correlated with indecisiveness in OCD (11).

An important result of the current study was to find the relationship of metacognitive beliefs of *need to control thoughts* to symptoms of checking, cleaning, and rumination. The present findings corroborate with cognitive theories of OCD that posit a significant role in the meaning and importance attached to random thoughts in the development and maintenance of obsessions and compulsions (3). In other words, normal intrusions are elevated to obsessions when individuals perceive them as dangerous or unacceptable. These individuals believe themselves to be responsible for the dreaded consequences or that having a thought of the event equates to the action occurring in reality (3). This belief results in a strong urge to control the thought, either by attempting to block it or performing a neutralizing compulsion. According to these findings, metacognitive therapy focused on *need to control thoughts* can be benefit for a large proportion of OCD patients.



Our study also demonstrated a relationship between beliefs of *cognitive self-consciousness* and slowness symptoms. A previous study (11) found a correlation between *cognitive self-consciousness* and indecisiveness. Intuitively, it seems likely that a constant focus directed toward one's thoughts, as assessed for *cognitive self-consciousness*, would contribute to indecision and slowness by increasing the cognitive system load and inefficient processing of material that would otherwise be processed non-consciously. Another result of the current study was that metacognitive beliefs of *positive beliefs* about worry were associated with checking symptoms. This finding has also been reported by a previous study of a sub-clinical sample (3). It has been proposed that checking symptoms may represent a way to avoid anxiety about the future (28). In this context, it seems natural that individuals who have strong beliefs about the usefulness of worry also use checking symptoms as a way to anticipate and avoid danger in the future.

The patterns of association between metacognitive scales and O-C symptoms were largely similar across the OCD and control samples, a finding that corresponds to another study (29). That study indicated that the metacognitive domains of thought fusion beliefs and beliefs about rituals were correlated with O-C symptoms in an OCD sample and a community sample. In the present study, the strength of associations between metacognitive variables and O-C symptoms was greater for the OCD group. Healthy controls differ from individuals with OCD primarily in the association of *positive beliefs* about worry with normally occurring O-C symptoms. The *positive beliefs* about worry subscale has also appeared in previous research as normal or mildly dysfunctional in individuals with OCD (4, 11).

Only a handful of studies have investigated the relationship between metacognitions and O-C symptom dimensions in OCD patients. Differences in emphasis on metacognitive variables, coupled with variations in definition and assessment of the specific symptom dimensions, make it difficult to compare findings across studies reliably. There are many limitations of this study. One limitation is an exclusive reliance on the Metacognitions Questionnaire to assess metacognitions in OCD, where other instruments used in conjunction may have helped to provide additional information. Other limitations include a sampling of patients on medications, given that SSRIs have previously been reported to reduce dysfunctional metacognitive beliefs (30). The effects of medication on metacognitive beliefs in OCD need to be investigated further. Also, the sample size of the OCD group was small. Therefore, the findings of this study need to be confirmed in larger samples. The final limitations of this study were that clinical insight, subsyndromal psychotic features, and response to treatment in patients were not evaluated. These clinical properties can be related to metacognitive beliefs.

Specific associations between metacognitive variables and the different symptom dimensions of OCD are evident. However, the severity of anxiety and depression also contributes to these associations. Further studies that assess a comprehensive range of metacognitive beliefs, along with neuropsychological and imaging indices, will contribute significantly to an integrative understanding of the factors underpinning the different symptom presentations of OCD, which is expected to enhance the development of specific and effective cognitive interventions.

**Ethics Committee Approval:** The approval was obtained from Pamukkale University Faculty of Medicine Ethics Committee.

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