International consensus has been achieved on the existence of several dysfunctional beliefs underlying the development and/or maintenance of the Obsessive-Compulsive Disorder (OCD). Nevertheless, questions such as the dimensionality of the belief domains and the existence of OCD-specific dysfunctional beliefs still remain inconclusive. The present paper addresses these topics through two different studies. Study 1: A series of confirmatory factor analyses (N = 573 non-clinical subjects) were carried out on the Obsessive Beliefs Spanish Inventory-Revised (OBSI-R), designed to assess dysfunctional beliefs hypothetically related to OCD. An eight-factor model emerged as the best factorial solution: responsibility, over-importance of thoughts, thought-action fusion—likelihood, thought action fusion—morality, importance of thought control, overestimation of threat, intolerance of uncertainty and perfectionism. Study 2: The OBSI-R and other symptom measures were administered to 75 OCD patients, 22 depressed patients, and 25 non-OCD anxious patients. Results indicated that, although OCD patients differed from their non-clinical counterparts on all of the OBSI-R subscales, no evidence of OCD-specificity emerged for any of the belief domains measured, as the OCD subjects did not differ from the other two clinical groups of patients.

Keywords: Obsessive-Compulsive Disorder, dysfunctional beliefs, Obsessive Beliefs Spanish Inventory, OBSI, Obsessive Beliefs Questionnaire, OBQ.
Current cognitive-behavioral approaches to Obsessive-Compulsive Disorder (OCD) emphasize the role of various dysfunctional beliefs in the genesis and/or maintenance of the disorder (Clark, 2004; Rachman, 1997; Salkovskis, 1999). On this point, the work carried out by the Obsessive-Compulsive Cognitions Working Group (OCCWG; 1997, 2001, 2003, 2005) is noteworthy. This group has made an ongoing effort to determine the most important OCD-relevant belief domains, providing operational definitions for every cognitive domain and developing multi-factorial instruments to adequately measure them.

According to the OCCWG (1997), there are six core OCD-relevant belief domains that constitute the six rationally-derived scales of the 87-item instrument developed by the group, the Obsessional Beliefs Questionnaire (OBQ; OCCWG, 2001, 2003): (a) Inflated responsibility; (b) Over-importance of thoughts. This domain also includes thought-action fusion beliefs; (c) Importance of controlling one’s thoughts; (d) Overestimation of threat; (e) Intolerance of uncertainty; and (f) Perfectionism. The OBQ has been demonstrated to be a reliable and valid measure of the beliefs hypothetically related to the OCD. The criterion-related validity (known-groups) and convergent validity of the OBQ have proven to be satisfactory. For example, OCD patients have been found to score higher than non-clinical controls on all the OBQ scales, and significant correlations have been observed between some of the OBQ scales and OCD symptom measures, even after controlling for non-OCD symptoms (OCCWG, 2001, 2003). Nevertheless, the instrument has revealed several shortcomings.

First, since its development, the dimensionality of the OBQ has been controversial. In fact, some studies have revealed a single factor structure (Faull, Joseph, Meaden, & Lawrence, 2004), and the OCCWG (2001, 2003) indicated a high overlapping between the six theoretically-derived subscales that was evident in both OCD and non-OCD samples. After a factor-analytic study, a reduced version of the OBQ was proposed containing 44 items included in three empirically-derived scales: Responsibility/Threat estimation, Importance/Control of thoughts and Perfectionism/Certainty (OCCWG, 2005). Woods, Tolin, & Abramowitz (2004) carried out a confirmatory factor analysis with a large student sample to test the six- and three-factor models proposed by the OCCWG, and they concluded that the two models fit the data poorly. Myers, Fisher, & Wells (2008) proposed a four-factor model (Responsibility, Threat estimation, Importance/Control of thoughts, and Perfectionism/ Certainty). This model was compared to the unifactorial and three-factor structures proposed by the OCCWG through a series of Confirmatory Factor Analyses (Wu & Carter, 2008), but none of the models fit the data, and these authors proposed a somewhat different structure with three factors. Second, the discriminant validity of the OBQ has been seriously questioned. The OCCWG (2001, 2003) pointed out that the OBQ scales appeared to be as highly correlated with non-OCD symptom measures as they were with OCD symptom measures. Furthermore, there are noteworthy inconsistencies among studies comparing OCD patients and non-OCD anxious controls when examining the existence of OCD-specific beliefs (Anholt et al., 2004; OCCWG, 2001, 2003; Tolin, Worhunsky, & Maltby, 2006). On the whole, there is a somewhat confusing picture concerning the existence of OCD-specific beliefs.

In the present study, we examine to what extent the limitations observed using the OBQ are also identifiable when another instrument specifically designed to measure OCD-beliefs is applied. To that end, we chose the Obsessive Beliefs Spanish Inventory (OBSI). Once the OCCWG had published their initial guidelines to measure belief domains hypothesized related to OCD (OCCWG, 1997), a self-report instrument was designed to measure obsessive beliefs in clinical and non-clinical Spanish individuals, the Obsessive Beliefs Spanish Inventory (Belloch, Cabedo, Morillo, Lucero, & Carrió, 2003; Cabedo, Belloch, Morillo, Giménez, & Carrió, 2004; Giménez, Morillo, Belloch, Carrió, & Cabedo, 2004). The contents of the 82 items initially included in a preliminary version of the OBSI were based on a former report on the OBQ (OCCWG, 1997) and other measures: the Thought-Action Fusion Scale (Shafran, Thordarson, & Rachman, 1996) and the Responsibility Attitude Scale (Salkovskis et al., 2000). After an item selection process, 58 items were retained, and the subsequent exploratory factor analyses revealed a structure somewhat different from that of the OBQ (Belloch et al., 2003; Cabedo et al., 2004; Giménez et al., 2004). One of the main differences between the OBQ and the OBSI is that TAF-Likelihood, TAF-Moral and Over-importance of thoughts are considered different rational dimensions in the OBSI. This decision was based on a series of exploratory factorial analyses and supported by some studies that suggested the independence of these cognitive beliefs (Rassin, Merckelbach, Muris, & Schmidt, 2001; Shafran et al., 1996; Yorulmaz, Yilmaz, & Gençöz, 2004). Later on, in a preliminary confirmatory factor analysis with non-clinical participants, the former 58 items were reduced to 50 items distributed in eight factors (Luciano, Belloch, Morillo, & García-Soriano, 2006), yielding a reduced version of the questionnaire called the OBSI-R.

The present paper reports on two studies using the OBSI-R, designed to provide further empirical evidence about the dimensionality and specificity of OCD-related belief domains. In our opinion, the use of different measures, as well as different samples, to assess the same OCD-related cognitive constructs (dysfunctional beliefs) constitutes a valid attempt at cross-validation and is an
appropriate way to advance the OCD cognitive research. In Study 1, the main goal was to use confirmatory factor analysis to analyze the latent factor structure of the OBSI-R in a larger non-clinical Spanish sample than the one used in the Luciano et al. (2006) study, in order to choose the factor model that best fit the data. Three different factor models were compared: the six- and three-factor models proposed by the OCCWG for the OBQ (2001, 2003, 2005) and the eight rationally derived factors from the OBSI-R version. In Study 2, the OBSI-R was applied to clinical participants: OCD, depressed, and non-OCD anxious patients. The first objective was to explore the overlap among the OBSI-R factors, as well as their associations with symptom measures, both in OCD participants and in a pooled non-OCD sample of participants. The second aim was to determine whether the obsessive beliefs domains appeared to be not only relevant but also OCD-specific.

Study 1

Method

Participants

A total sample of 573 non-clinical subjects was recruited from two different sites: 139 were undergraduate Psychology students who participated in the study in exchange for course credit; and 434 were community members recruited with the collaboration of final year Psychology students attending a series of seminars on OCD cognitive research carried out at the University by the authors. Nearly 70% of the participants were women (n = 387), and their mean age was 27.37 years (SD = 11.09). Approximately 55% were single, 85% identified themselves as having a medium socio-economic level, and 50% had University level studies. All the individuals gave their explicit consent to participate in the present research.

Measures

The Obsessive Beliefs Spanish Inventory-Revised (OBSI-R) is a 50-item self-report questionnaire with eight rationally and factor-analytically derived scales: Inflated responsibility (7 items); Over-importance of thoughts (5 items); Thought action fusion-likelihood (5 items); Thought action fusion-moral (7 items); Importance of controlling one’s thoughts (5 items); Overestimation of threat (8 items); Intolerance of uncertainty (6 items), and Perfectionism (7 items). Subjects are asked to indicate their agreement with each statement on a 7-point rating scale ranging from 1 (strongly disagree) to 7 (strongly agree). The subscale scores are added together to yield a total score ranging from 50 to 350, with higher scores representing a greater strength of dysfunctional beliefs related to one’s own thoughts.

Procedure

The participants were drawn from different research projects, so that other different psychopathological measures were administered across the groups. The undergraduates completed the instruments in a group session lasting approximately 30 minutes, whereas the non-university participants completed the instruments individually. In all cases, the questionnaires were presented in a randomized order with a separate cover page evaluating demographic information and the possible existence of psychological disorders, relevant diseases, and recent psychological or pharmacological treatments.

Data analytic approach

The structural equation modeling program EQS version 6.1 for Windows (Bentler, 1995) and the Statistical Package for Social Sciences (SPSS) version 13.0 for Windows were used to perform the statistical analyses. Regarding the confirmatory factor analyses, the Maximum Likelihood (ML) with robust correction was the estimation method used for all the models, in order to avoid distributional problems in the data set. To assess the fit of the aforementioned factor models, we used the chi-square ($\chi^2$) as well as the Comparative Fit Index (CFI), the Goodness of Fit Index (GFI), the Root Mean Square Error of Approximation (RMSEA) with 90% confidence interval, and Akaike’s Information Criterion (AIC). Following the recommendations of several authors (Gerbing & Anderson, 1993; Hu & Bentler, 1995; Kaplan, 2000; Marsh, Balla & Hau, 1996), the following criteria indicate a good fit of the models to the data: CFI and GFI > .90, RMSEA < .05, and non significant chi-square. Smaller chi square values indicate better fit than larger values. The analytical fit was also considered by examining the factor solution and the factor loadings of each item in the factor to which it is assigned.

Results

Confirmatory Factor Analyses of the OBSI-R

First, we tested the six-factor model initially proposed by the OCCWG (1997, 2001). All the indices showed that

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1 A sample copy of the OBSI-R is available upon request to authors.
This was not a good fitting model for the OBSI-R. This model had a significant chi-square \(\chi^2 = 3397.281, p \leq .00001\), a GFI of .731, a CFI of .751, and a RMSEA of .058. Then, we tested the three-factor model recently proposed by the OCCWG (2005). The results of testing this model showed that it also provides a poor fit to the data as evidenced by all the fit indices. Thus, the GFI and CFI of .65, the RSMEA of .068, and the significant chi-square \(\chi^2 = 4316.4024, p \leq .00001\) indicated a substantial decrease in fit. The fit for the three-factor model was worse than the fit achieved by the six-factor model on all the fit indices. Finally, the adequacy of the eight-factor solution initially proposed by the OBSI-R authors approached criterion values. The RMSEA yielded a value of .041 (with a 90% confidence interval of .039 -.044), which indicates an excellent fit. However, the other indices only approached the established criteria, as the CFI and GFI obtained values of .876 and .836, respectively. In addition, the chi-square was statistically significant \(\chi^2 = 2259.155, p \leq .00001\) but smaller than the chi square obtained for the other models.

In order to compare the three models, we took into account the AIC, which showed that the eight-factor model fit the data much better (AIC = -34.84469) than either the three (AIC = 1972.40243) or the six-factor models (AIC = 1077.28149). The eight-factor solution, despite being the more complex alternative, was therefore selected as the best model for our data. Moreover, seven scales based on the factor analytic results had adequate internal consistency (Cronbach’s α): Inflated Responsibility (F1) = .78, Thought Action Fusion-Likelihood (F3) = .86, Thought Action Fusion-Morality (F4) = .87, Importance of Control (F5) = .81, Overestimation of Threat (F6) = .82, Intolerance of Uncertainty (F7) = .77, and Perfectionism (F8) = .80. However, for Importance of Thoughts (F2) a lower internal consistency was obtained (α = .69). The factor loadings were all significant \(p \leq .01\) and ranged from .34 to .70, from .33 to .81, and from .46 to .83 for the three-, six- and eight-factor models, respectively, indicating that the eight-factor structure had better defined latent constructs because all the items showed high loadings \(\geq .45\) on the factors they were assigned to. However, in the other factor solutions some items showed small loadings.

Discussion

The OBSI-R is a self-report measure to assess obsessive beliefs in Spanish subjects (Belloch et al., 2003). In the present study, our first goal was to analyze the latent factor structure of this instrument using confirmatory factor analyses. The most important difference between the OBSI-R and the OBQ (OCCWG, 2001, 2003, 2005) is that over-importance of thoughts, thought action fusion-likelihood and thought action fusion-moral are not a unified single construct in the former, while they are in the latter. Therefore, it was of particular interest to examine the comparative fit of the eight-factor solution proposed by the OBSI-R authors versus the six- and three-factor solutions proposed by the OCCWG (2003, 2005) for the OBQ.

Overall, the analyses indicated that the six- and three-factor models did not fit the data well and should be rejected. In both cases, the chi square values reached significance, the CFI and the GFI values were smaller than .80, and the RMSEA was greater than .05. The inadequacy of these factor models is not surprising, given that Woods et al. (2004) obtained a similar result when they examined the dimensionality of the OBQ in a large student sample. The confirmatory factor analyses performed by these authors revealed that the rationally-derived six-factor model (OCCWG, 2001) and the empirically-derived three-factor model (OCCWG, 2005) each had a very unsatisfactory fit. Given the poor fit of both models, Woods et al. (2004) carried out an exploratory factor analysis that yielded one large factor (OBQ-General) and three smaller factors (thought, perfectionism, and responsibility). Taylor, McKay, and Abramowitz (2005) obtained a similar result with an OCD sample. They performed a hierarchical factor analysis of the OBQ and found that it comprised of three lower-order factors and a single higher-order factor. This hierarchical factor structure was not tested in the present work because of its similarity to the three-factor model proposed by the OCCWG (2005). Regarding the eight-factor model, the chi square value was significant but smaller than in the other models. The CFI and the GFI were higher than in the other models, and the RMSEA was smaller than .05, with this latter index indicating a close fit. Furthermore, this solution presented the lowest AIC value, and the item loadings on their respective factors were stronger (range: .46 to .83) than those obtained in the six- and three-factor solutions (range: .33 to .81 and .34 to .70, respectively). It is also important to highlight that the eight factors had adequate internal consistency coefficients. Taken together, these findings suggest that the eight-factor solution could be considered the most adequate, and would be retained for the subsequent analyses. Nevertheless, the poor fit obtained for the Chi square, RMSEA, GFI and CFI indexes must be considered a limitation of the factor solution finally adopted.

Study 2

Method

Participants

75 subjects with a primary axis I DSM-IV (APA, 1994) OCD diagnosis, 25 subjects with anxiety disorders distinct from OCD (Anxious Controls-AC), and 22 subjects with a depressive disorder (Depressed Controls-DC) participated.
in this study. In order to ensure that the groups were diagnostically distinct, only patients who presented a primary Axis I diagnosis of OCD, Depression, or a non-OCD Anxiety Disorder without current comorbid conditions were eligible for the study. Characteristics and specific diagnoses of the clinical groups were as follows.

The 75 OCD patients had an Axis I primary diagnosis of OCD without any comorbid clinically significant psychopathological disorder at the time of the study. Participants in this group were 53.3% women; they had a mean age of 33.9 (SD = 10.85) years. On average, the duration of their disorder was about 8.97 (SD = 9.04) years. The 25 AC patients had a primary DSM-IV (APA, 1994) diagnosis of anxiety disorder distinct from OCD. Their mean age was 32 (SD = 9.2) years, and 60% were women. The specific diagnoses, according to the DSM-IV criteria, were as follows: 11 participants had panic disorder with agoraphobia; 7 were diagnosed as having generalized anxiety disorder (GAD); 6 participants had social phobia; and 1 participant had posttraumatic stress disorder. The 22 DC patients had a mean age of 44.9 (SD = 10.7) years, and 82% were women. Fourteen of them had a primary axis I DSM-IV diagnosis of major depressive disorder (6 subjects with a single episode and 8 recurrent), 7 participants had a dysthymic disorder, and 1 participant had both major depression and dysthymia. None of them had any other clinically significant current co-morbid disorder.

The same non-clinical sample from Study 1 was also utilized for some of the statistical analyses conducted throughout Study 2.

**Measures**

The **Obsessive-Compulsive Inventory—Revised (OCI–R; Foa et al., 2002)** is an 18-item self-report questionnaire that assesses distress associated with various obsessive-compulsive symptoms. The OCI–R provides a total score (ranging from 0 to 72) and scores on six subscales (washing, checking, ordering, obsessional hoarding and neutralizing). Items are rated on a 5-point scale. The Spanish version of the OCI–R (Fullana et al., 2004), which replicated the original factor structure and showed psychometric properties similar to the original version, was used. In the Spanish version, the Cronbach’s α values ranged from .61 (neutralizing subscale) to .82 (obsessing). The OCI–R was only administered to a subgroup of the OCD participants (n = 35).

The **Padua Inventory—Washington State University Revision (PI–WSUR; Burns, Keortge, Formea, & Sternberg, 1996)** includes 39 items measuring obsessions and compulsions. Each item is rated on a 5-point scale according to the degree of disturbance caused by the thought or behavior (0 = “not at all” to 4 = “very much”). The items are distributed in five subscales: (a) obsessional thoughts about harm to oneself or others; (b) obsessional impulses to harm oneself or others; (c) contamination obsessions and washing compulsions; (d) checking compulsions; and (e) dressing/grooming compulsions.

The published Spanish versions of the Padua Inventory have shown adequate reliability and validity in both non-clinical and clinical samples (Mataix-Cols, Sanchez-Turet, & Vallejo, 2002), and they replicate the five factor structure of the Burns et al. (1996) 39 item version, which has been applied in the current study (Ibáñez, Olmedo, Peñate, & González, 2002). Nonetheless, as the former study was based on the 60-item version of the inventory (Sanavio, 1988), and the latter does not offer reliability data, we calculated the internal consistency of the PI–WSUR for the current study. The Cronbach’s alpha coefficients obtained in the non-clinical subjects from Study 1 were the following: .60, .62, .67, .79, .71, and .68 for the five subscales and the total score, respectively. In the OCD group, similar alpha values were obtained (from α = .61 for obsessional thoughts to α = .74 for the checking compulsions subscale). This measure was only administered to a subgroup of the OCD participants (n = 40), and it was also completed by the DC, AC, and non-clinical participants.

The **Beck Depression Inventory (BDI; Beck & Steer, 1993)** is a widely used and validated self-report measure of depressive symptoms. The Spanish version has demonstrated sound psychometric properties in a large sample of 1393 university students: α = .83; test-retest reliability ranging from .60 to .72 for three different subgroups (Sanz & Vázquez, 1998). The same authors (Vázquez & Sanz, 1999) explored the psychometric characteristics of the BDI on 338 patients with various anxiety and depressive disorders, and they reported an alpha value of .90. The total score classified 88% of the depressed patients well, compared to the anxious subjects. The BDI was completed by all the participants in the study and also by the non-clinical subjects from Study 1.

The **Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990)** is a 16-item self-report inventory designed to assess the generality, excessiveness and uncontrollability dimensions of worry. The Spanish version applied in this study (Sandín & Chorot, 1991) has demonstrated good psychometric properties in a community sample of 554 subjects (Cronbach’s α = .83; Mean 45.08, SD = 10.40; percentage of variance explained, one factor = 35.8%). The PSWQ was completed by all the participants in the current study and by the non-clinical subjects from Study 1.

The **State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970)** is a 40-item self-reported measure of general anxiety. In the present study, we only used the state version (Spanish validation: Seisdedos, 1988), which was completed by all the patients and by the non-clinical participants from Study 1, and showed good psychometric properties (Cronbach’s α = .92; test-retest reliability: r = .81).


Procedure

Clinical participants (OCD, AC, and DC patients) were recruited from three outpatient mental-health clinics located in a Spanish city and its outskirts and included in the public Spanish National Health System network. All potential clinical participants were individually screened with a full history and an examination by an experienced psychiatrist, who first referred the patients to the study. Then, one of the authors completed the examination of the patient, confirmed the DSM-IV diagnoses (APA, 1994) using the Anxiety Disorders Interview Schedule (ADIS-IV) and, finally, decided whether to include the patients in the study. Patients with a previous or current history of alcohol/drug-related disorders or an inadequate level of reading ability were not included in the study. Informed consent was obtained in all cases before the participants completed the study measures. The patients were recruited throughout a two-year period. During this time the test protocol was changed, especially for the OCD symptom measures. In the beginning the patients completed the PI-WSUR. However, later this measure was substituted by the Spanish version of the OCI-R, a shorter instrument that seems better-suited to the OCD cognitive model and that was shown to have better psychometric properties in our context than the Padua Inventory.

Results

Reliability data of the OBSI-R in OCD clinical sample

We analyzed the internal consistency of the OBSI-R subscales for the clinical OCD sample (n = 75). Cronbach’s alpha coefficients were the following: Inflated Responsibility (α = .69); Importance of thoughts, (α = .69); Thought action-fusion-likelihood (α = .86); Thought action-fusion-moral (α = .81); Importance of control (α = .72); Overestimation of threat (α = .78); Intolerance to uncertainty (α = .76); Perfectionism (α = .85). The Cronbach’s alpha for the OBSI-R-total score was excellent (α = .92). These data indicate a lower than optimal internal consistency for the inflated responsibility and importance of thoughts subscales, whereas the other six subscales showed α values ranging from adequate to excellent.

Table 1

<table>
<thead>
<tr>
<th>OBSI-R Subscales</th>
<th>R</th>
<th>IT</th>
<th>TAF-L</th>
<th>TAF-M</th>
<th>IC</th>
<th>OT</th>
<th>IU</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsibility (R)</td>
<td></td>
<td></td>
<td>.41c</td>
<td>.49c</td>
<td>.56c</td>
<td>.41c</td>
<td>.57c</td>
<td>.35c</td>
</tr>
<tr>
<td>Importance of Thoughts (IT)</td>
<td>.36c</td>
<td></td>
<td>.32b</td>
<td>.25c</td>
<td>.15</td>
<td>.09</td>
<td>.05</td>
<td>.12</td>
</tr>
<tr>
<td>Thought-action fusion-likelihood</td>
<td>.28c</td>
<td>.43c</td>
<td></td>
<td>.22c</td>
<td>.28c</td>
<td>.39c</td>
<td>.24c</td>
<td>.29c</td>
</tr>
<tr>
<td>Thought-action fusion-Morality (TAF-M)</td>
<td>.50c</td>
<td>.46c</td>
<td>.35c</td>
<td></td>
<td>.28c</td>
<td>.24c</td>
<td>.21</td>
<td>.20</td>
</tr>
<tr>
<td>Importance of Controlling (IC)</td>
<td>.58c</td>
<td>.42c</td>
<td>.40c</td>
<td>.48c</td>
<td></td>
<td>.50c</td>
<td>.72c</td>
<td>.43c</td>
</tr>
<tr>
<td>Overestimation of threat (OT)</td>
<td>.42c</td>
<td>.40c</td>
<td>.44c</td>
<td>.34c</td>
<td>.51c</td>
<td></td>
<td>.50c</td>
<td>.37c</td>
</tr>
<tr>
<td>Intolerance to Uncertainty (IU)</td>
<td>.55c</td>
<td>.35c</td>
<td>.32c</td>
<td>.48c</td>
<td>.66c</td>
<td>.57c</td>
<td></td>
<td>.59c</td>
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<td>Perfectionism (P)</td>
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<td>.41c</td>
<td>.30c</td>
<td>.36c</td>
<td>.46c</td>
<td>.50c</td>
<td>.57c</td>
<td></td>
</tr>
</tbody>
</table>

Note. Correlations above the diagonal are for the OCD group (n = 75). Correlations below the diagonal are for the combined anxious, depressive and non-clinical participants (n = 597, after listwise deletion).

*p < .05; *p < .01; *p < .001
of threat and Perfectionism/Intolerance to Uncertainty. Regarding the non-OCD pooled sample, the largest correlation coefficients were the same as those previously observed in the OCD subjects, but, moreover, two additional large correlation coefficients were also observed: Responsibility/ TAF-M, and Overestimation of Threat/ Perfectionism. In sum, regarding the level of overlapping among the OBSI-R scales, the pattern observed in the OCD participants was different from the one obtained in the non-OCD subjects: Thirteen coefficients were small in the former group, whereas there was only one small coefficient in the latter. The lowest correlation coefficients in the OCD subjects were found among the domains of Importance of thoughts, TAF-L, and TAF-M (see Table 1).

Convergent and discriminant validity: Association of the OBSI-R with symptom measures

In order to test the convergent and discriminant validity of the OBSI-R, zero-order correlations were computed between the OBSI-R subscales and the total scores on measures of OCD symptoms (PI-WSUR, OCI-R), depression (BDI), state-anxiety (STAI-S) and worry (PSWQ). As in the OCCWG studies, we also computed the correlations separately for the OCD group and for a pooled non-OCD sample (including DC and AC patients and NC participants). The results are displayed in Table 2. The PI-WSUR subscales showed few relationships with the symptom dimensions, zero order correlations were calculated between the OBSI-R and the OCI-R and PI-WSUR subscales (OCD sample). The results are displayed in Table 3. Regarding the OCI-R, the checking and ordering symptom dimensions showed the greatest number of relationships with dysfunctional beliefs subscales, followed by the hoarding and mental neutralizing symptoms. In contrast, the washing symptom subscale was only related to perfectionism, whereas obsessing was only associated with TAF-Morality. Taking into account the belief domains, responsibility, TAF-L, and Importance of controlling thoughts showed the greatest number of relationships with the symptom dimensions, whereas the importance of thoughts belief was not associated with any OCI-R subscale.

The PI-WSUR subscales showed few relationships with dysfunctional beliefs, and the size of the coefficients was generally lower than what was obtained with the OCI-R. Checking and dressing/grooming compulsions were the two symptom dimensions that maintained more relationships with the OBSI-R subscales, whereas (.61 vs .35). As for the OBSI-R subscales, all of them appeared to be moderately to largely related to the OCI-R (OCD sample). However, only a proportion of the OBSI-R subscales appeared to be significantly related to the PI-WSUR. On the other hand, the majority of the OBSI-R subscales showed significant but moderate relationships with depressive symptoms (BDI), with the exception of the TAF-M beliefs.

In order to examine the associations among the obsessional belief domains and the OCD symptom dimensions, zero order correlations were calculated between the OBSI-R and the OCI-R and PI-WSUR subscales (OCD sample). The results are displayed in Table 3. Regarding the OCI-R, the checking and ordering symptom dimensions showed the greatest number of relationships with dysfunctional beliefs subscales, followed by the hoarding and mental neutralizing symptoms. In contrast, the washing symptom subscale was only related to perfectionism, whereas obsessing was only associated with TAF-Morality. Taking into account the belief domains, responsibility, TAF-L, and Importance of controlling thoughts showed the greatest number of relationships with the symptom dimensions, whereas the importance of thoughts belief was not associated with any OCI-R subscale.

Table 2

<table>
<thead>
<tr>
<th>MEASURES</th>
<th>OBSI-R</th>
<th>OCI-R</th>
<th>PI-WSUR</th>
<th>BDI</th>
<th>STAI-S</th>
<th>PSWQ</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>OCD (n = 35)</td>
<td>OCD (n = 40)</td>
<td>Non-OCD (n = 317)</td>
<td>OCD (n = 75)</td>
<td>Non-OCD (n = 359)</td>
<td>OCD (n = 75)</td>
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<tr>
<td>OBSI-R-Total</td>
<td>.61**</td>
<td>.35**</td>
<td>.35**</td>
<td>.35**</td>
<td>.47**</td>
<td>.19</td>
</tr>
<tr>
<td>Responsibility</td>
<td>.54**</td>
<td>.27</td>
<td>.22**</td>
<td>.08</td>
<td>.33**</td>
<td>.07</td>
</tr>
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<td>.27</td>
<td>.14**</td>
<td>.07</td>
<td>.22**</td>
<td>-.13</td>
</tr>
<tr>
<td>TAF-L</td>
<td>.45**</td>
<td>.43**</td>
<td>.19**</td>
<td>.14</td>
<td>.32**</td>
<td>-.13</td>
</tr>
<tr>
<td>TAF-M</td>
<td>.36**</td>
<td>-.06</td>
<td>.13**</td>
<td>.09</td>
<td>.21**</td>
<td>.14</td>
</tr>
<tr>
<td>IC</td>
<td>.53**</td>
<td>.31**</td>
<td>.28**</td>
<td>.41**</td>
<td>.35**</td>
<td>.21</td>
</tr>
<tr>
<td>OT</td>
<td>.46**</td>
<td>.41**</td>
<td>.41**</td>
<td>.51**</td>
<td>.61**</td>
<td>.46**</td>
</tr>
<tr>
<td>IU</td>
<td>.41**</td>
<td>.18</td>
<td>.28**</td>
<td>.29**</td>
<td>.30**</td>
<td>.18</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>.48**</td>
<td>.22</td>
<td>.22**</td>
<td>.25**</td>
<td>.33**</td>
<td>.07</td>
</tr>
</tbody>
</table>

Note. OCI-R: Obsessive-Compulsive Inventory-Revised; PI-WSUR: Padua Inventory – Washington State University Revision; BDI: Beck Depression Inventory; STAI-S: State-Trait Anxiety Inventory-State version; PSWQ: Penn State Worry Questionnaire; IT: Importance of Thoughts; TAF-L: Thought-action fusion-likelihood; TAF-M: Thought-action fusion-Morality; IC: Importance of Controlling; OT: Overestimation of threat; IU: Intolerance to Uncertainty.

*p < .05; **p < .01; ***p < .001
Contamination and Washing did not correlate with any of the belief domains. Regarding the belief subscales, TAF-morality, intolerance to uncertainty, and perfectionism did not show any significant association with the PI-WSUR symptom dimensions.

Differences between OCD patients, and depressed, anxious and non-clinical controls

One-way ANOVAs and non-parametric analyses (chi-square) revealed that the four groups were comparable in their demographic data, with the only exception of age, where the DC patients differed significantly from the other groups. Regarding OCD symptoms (PI-WSUR), the OCD subjects scored significantly higher than the depressed controls, but there were no differences between OCD and AC patients on the Dressing/grooming compulsions subscale (Mean ± SD: OCD = 2.5 ± 2.4; AC = 2.1 ± 1.8). Additionally, in the Harm obsessions and Harm impulses subscales, the obsessive patients did not score differently from depressed subjects (Harm obsessions: OCD = 8.5 ± 1.7; DC = 9.1 ± 2.04; Harm impulses: OCD = 11.5 ± 8.8; DC = 9.5 ± 7.9).

In order to test criterion-related validity, the mean scores on the eight OBSI-R subscales were compared across the four study groups. To protect against Type I error, a 4 x 8 multivariate analysis of variance (MANOVA, group by OBSI-R subscale) was conducted. The overall MANOVA turned out to be significant (Pillai’s $F_{24,1986} = 9.78, p < .001$).

Every subsequent ANOVA was significant, and Tukey post-hoc comparisons were conducted. The Levene test for homogeneity of variances was significant on three of the OBSI-R subscales (IT, TAF-L and P). In these cases, Games-Howell post-hoc comparisons were conducted. Results are shown in Table 4.

As shown in Table 4, the OCD subjects scored significantly higher than the NC participants on the OBSI-R Total score and on each OBSI-R subscale. Moreover, the OCD subjects scored higher than the other anxious patients (AC group) on responsibility, importance of thoughts, TAF, and perfectionism belief domains. In contrast, the OCD patients did not differ from the depressed control group on any of the OBSI-R subscales. Therefore, although our data on the criterion-related validity of the OBSI-R support the OCD-relevance of the measured belief domains, they suggest the absence of a specific link between OCD and the dysfunctional belief domains assessed by the OBSI-R, given that depressed subjects scored similarly to obsessive-compulsive subjects on all these beliefs.

Discussion

Study 2 was conducted, first, to examine the reliability and level of overlap among the obsessive belief factors, as well as their association with symptom measures, both in OCD and non-OCD participants. The second purpose of this study was to provide further testing of the relevance and specificity of the dysfunctional belief domains in OCD patients.

Table 3.

Correlations among Obsessive Beliefs (OBSI-R) and obsessive-compulsive symptoms (OCI-R and PI-WSUR) in OCD patients.

<table>
<thead>
<tr>
<th>OBSI-R subscales</th>
<th>R</th>
<th>IT</th>
<th>TAF-L</th>
<th>TAF-M</th>
<th>IC</th>
<th>OT</th>
<th>IU</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Obsessive-Compulsive Inventory-Revised (N=35)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Washing</td>
<td>.02</td>
<td>.12</td>
<td>.14</td>
<td>.02</td>
<td>.05</td>
<td>.14</td>
<td>.05</td>
<td>.35</td>
</tr>
<tr>
<td>Obsessing</td>
<td>.26</td>
<td>.04</td>
<td>.11</td>
<td>.33*</td>
<td>.27</td>
<td>.17</td>
<td>.15</td>
<td>.06</td>
</tr>
<tr>
<td>Hoarding</td>
<td>.39*</td>
<td>.16</td>
<td>.50*</td>
<td>.34*</td>
<td>.33*</td>
<td>.27</td>
<td>.22</td>
<td>.14</td>
</tr>
<tr>
<td>Ordering</td>
<td>.52*</td>
<td>.28</td>
<td>.46*</td>
<td>.29</td>
<td>.53*</td>
<td>.32</td>
<td>.42</td>
<td>.52</td>
</tr>
<tr>
<td>Checking</td>
<td>.56*</td>
<td>.09</td>
<td>.34*</td>
<td>.27</td>
<td>.57*</td>
<td>.47*</td>
<td>.60</td>
<td>.57</td>
</tr>
<tr>
<td>Mental neutralizing</td>
<td>.46*</td>
<td>.11</td>
<td>.53*</td>
<td>.19</td>
<td>.37*</td>
<td>.43*</td>
<td>.17</td>
<td>.23</td>
</tr>
</tbody>
</table>

| **Padua Inventory – Washington State University Revision (N = 40)** |
| Harm obsessions                          | .06  | .17  | .26   | .06   | .03 | .33*| .15  | .07  |
| Harm impulses                             | .03  | .37* | .21   | .12   | .16 | .17 | .09  | .10  |
| Contamination & Washing                   | .14  | .05  | .12   | .10   | .19 | .16 | .08  | .12  |
| Checking                                  | .34* | .18  | .46*  | .04   | .27 | .39*| .26  | .23  |
| Dressing/grooming compulsions             | .23  | .33* | .41*  | .06   | .31*| .28 | .18  | .19  |

Note. R: responsibility; IT: Importance of Thoughts; TAF-L: Thought-action fusion-likelihood; TAF-M: Thought-action fusion-Morality; IC: Importance of Controlling; OT: Overestimation of threat; IU: Intolerance to Uncertainty; P: Perfectionism

*p < .05; **p < .01; ***p < .001
The OBSI-R subscales showed adequate reliability in the clinical OCD sample, and the factors were relatively independent. Looking at the correlations among the OBSI-R subscales, we have found a smaller amount of overlapping than what was reported with the OBQ. In fact, the OCCWG reported that the correlations among the six rationally-derived and the three empirically-derived OBQ subscales fell between .60 and .81 (OCCWG, 2001), and between .63 and .73 (OCCWG, 2005), respectively. In the current study, there is only one correlation coefficient above .60, the one between Intolerance to Uncertainty and Importance of controlling, both in the OCD clinical sample ($r = .72$) and in the pooled non-OCD sample ($r = .66$). It is especially noteworthy that the lowest level of overlapping was found among the domains of Importance of thoughts, TAF-L, and TAF-M and the other subscales in the OCD sample, whereas in the non-OCD subjects the size of the correlations among these three subscales and the other four was medium. These results suggest that the associations among these belief domains do not follow the same pattern when OCD is manifested as when the disorder is not present. Moreover, it must be kept in mind that these three subscales (IT, TAF-L, TAF-M) were originally considered by the OCCWG in a single dimension of “Over-importance of thoughts”, but in our analyses they appeared consistently as different belief dimensions. These results indicate that the OBSI-R and the OBQ are more different than initially expected, which makes it difficult to compare the results obtained with the two instruments, at least regarding IT and TAF beliefs.

With regard to the associations among the obsessional belief domains and the OCD symptoms, our results showed that, regardless of the symptom measure applied, OCI-R or PI-WSUR, checking symptoms were the ones

### Table 4
**Group comparisons on the OBSI-R subscales**

<table>
<thead>
<tr>
<th>OBSI-R</th>
<th>OCD ($n = 75$)</th>
<th>DC ($n = 22$)</th>
<th>AC ($n = 25$)</th>
<th>NC ($n = 552$)</th>
<th>F</th>
<th>Partial $\eta^2$</th>
<th>Significant Tukey post-hoc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total score</td>
<td>198.1 (39.4)</td>
<td>215.1 (44.2)</td>
<td>183.6 (44.8)</td>
<td>151.7 (40.2)</td>
<td>45.74</td>
<td>.17</td>
<td>OCD, DC, AC &gt; NC</td>
</tr>
<tr>
<td>Responsibility</td>
<td>31.2 (7.9)</td>
<td>35.7 (6.9)</td>
<td>28.2 (9.6)</td>
<td>27.1 (8.1)</td>
<td>12.85</td>
<td>.06</td>
<td>OCD, DC &gt; NC</td>
</tr>
<tr>
<td>Importance of Thoughts</td>
<td>12.0 (5.4)</td>
<td>13.8 (6.2)</td>
<td>10.8 (4.4)</td>
<td>10.0 (4.4)</td>
<td>8.17</td>
<td>.04</td>
<td>OCD, DC &gt; AC, NC</td>
</tr>
<tr>
<td>TAF-L</td>
<td>13.6 (6.9)</td>
<td>14.1 (6.2)</td>
<td>12.9 (4.4)</td>
<td>9.2 (4.4)</td>
<td>21.37</td>
<td>.09</td>
<td>OCD, DC &gt; AC, NC</td>
</tr>
<tr>
<td>TAF-M</td>
<td>25.2 (9.3)</td>
<td>27.3 (11.5)</td>
<td>21.8 (9.3)</td>
<td>21.1 (9.3)</td>
<td>6.68</td>
<td>.03</td>
<td>OCD, DC &gt; AC, NC</td>
</tr>
<tr>
<td>Importance of Controlling</td>
<td>26.0 (5.7)</td>
<td>27.1 (4.9)</td>
<td>25.7 (7.1)</td>
<td>18.2 (6.6)</td>
<td>42.20</td>
<td>.18</td>
<td>OCD, DC, AC &gt; NC</td>
</tr>
<tr>
<td>Overestimation of threat</td>
<td>34.4 (9.2)</td>
<td>38.3 (8.4)</td>
<td>33.0 (8.2)</td>
<td>22.8 (8.7)</td>
<td>63.05</td>
<td>.22</td>
<td>OCD, DC, AC &gt; NC</td>
</tr>
<tr>
<td>Intolerance to Uncertainty</td>
<td>30.0 (6.7)</td>
<td>30.1 (5.9)</td>
<td>28.7 (7.4)</td>
<td>24.1 (6.8)</td>
<td>22.57</td>
<td>.09</td>
<td>OCD, DC, AC &gt; NC</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>25.7 (9.5)</td>
<td>28.8 (9.4)</td>
<td>22.6 (8.5)</td>
<td>19.2 (7.5)</td>
<td>23.94</td>
<td>.10</td>
<td>OCD, DC &gt; AC, NC</td>
</tr>
</tbody>
</table>

**Note.** $p < .001$. Data are expressed as Means (Standard Deviation).

OCD: Obsessive-Compulsive patients; DC: Depressed control patients; AC: non-OCD Anxious control patients; NC: non-clinical subjects.
most associated with dysfunctional beliefs, whereas washing symptoms were less clearly related to these kinds of beliefs. These results support the notion that the dysfunctional beliefs may play a definite role in only some modalities or subtypes of OCD, whereas their role in other OCD manifestations might be questionable (Calamari et al., 2006; Taylor et al., 2006).

Our results generally support the OCD-relevance of the belief domains measured by the OBSI-R. On the one hand, the correlational analyses revealed that the OBSI-R subscales appeared to be consistently associated with OCD measures, and this is especially true when the OCI-R is considered. On the other hand, OCD participants scored significantly higher than non-clinical controls on every OBSI-R subscale and on most of these subscales when OCD individuals were compared to non-OCD anxious patients. Previous results found using the OBSI initial version followed a similar pattern. Bellocchio et al. (2003) found that all the OBSI subscales correlated significantly with the Maudsley Obsessive-Compulsive Inventory (MOCI). Cabedo et al. (2004) found that subclinically obsessive participants (on the basis of cut-off scores on the MOCI) scored higher than non-clinical participants on every OBSI-R subscale (except for the TAF subscales). Results published using the OBQ in different stages of research have supported the OCD-relevance of the six originally proposed and rationally derived OBQ scales (OCCWG, 2001), as well as the three empirically derived OBQ factors (OCCWG, 2003, 2005; Tolin et al., 2006).

In all of these studies, OCD patients were distinguishable from their non-clinical counterparts on the OBQ scores.

When examining the correlations among OBSI-R total score and symptom measures, moderate to high correlations were found between our questionnaire and OCD symptoms (measured with the PI-WSUR and the OCI-R), depressive symptoms (BDI) and worry proneness (PSWQ), thus indicating a questionable discriminant validity of the OBSI-R. Nonetheless, it should be pointed out that the association between the OBSI-R and BDI was clearly inferior to the one found between the OBSI-R and OCI-R, unlike what occurs when comparing the PI-WSUR / OBSI-R / BDI association. Furthermore, our results are similar to those reported by the OCCWG (2003), where the range of correlations between the OBQ and PI-WSUR was the same as the one found between the OBQ and BDI (from .32 to .55). Therefore, it is possible that the problem of discriminant validity lies not only in the OBSI-R (or in the OBQ), but also in the PI-WSUR, at least in our context. In this sense, we must highlight the fact that not all the subscales of the PI-WSUR clearly differentiate between OCD, depressed and anxious patients.

Regarding the between-groups analyses, we observed that clinical OCD subjects were not distinguishable from their clinically depressed and anxious counterparts on the OBSI-R total score. Moreover, none of the belief domains measured with the OBSI-R was able to distinguish OCD patients from clinically depressed participants. This result raises serious doubts about the specificity of the dysfunctional beliefs hypothesized by current cognitive conceptualizations in explaining OCD. It also leads to the conclusion that these dysfunctional beliefs, at least as measured with the OBSI-R, are not specifically associated with obsessive-compulsive pathology.

Since earlier studies, several belief domains have been hypothesized as non-specific OCD beliefs, and they have been proposed as underlying different emotional disorders. For example, overestimation of threat beliefs have been proposed as being important for understanding anxiety disorders in general (Mathews, 1990; Sookman & Pinard, 2003). Beliefs concerning perfectionism have been associated with disorders such as social phobia, depression or anorexia nervosa (Frost, Novara, & Rênaume, 2003; Frost & Steketee, 1997), and the intolerance of uncertainty belief has been hypothesized as underlying pathological worry/GAD (Buhr & Dugas, 2002; Dugas, Gagnon, Ladouceur, & Freeston, 1998). Other studies (Abramowitz, Whiteside, Lynam, & Kalsy, 2003; Rassin et al., 2001) have suggested that TAF beliefs are not OCD specific, since they are important in other emotional disorders as well. Furthermore, Abramowitz et al. (2003) concluded that negative affect is a mediator between TAF beliefs and OCD.

Some recent studies using the questionnaire developed by the OCCWG (OBQ) have been very critical about the OCD-specificity of the belief domains. In fact, there are important inconsistencies among studies about the existence of OCD-specific beliefs when OCD patients and non-OCD anxious controls (AC) are compared. The OCCWG (2001) initially found that perfectionism was the only belief domain that did not discriminate between OCD and AC patients, although the small number of AC subjects (n = 12) in their study limited the strength of their conclusions. In later studies, when larger clinical samples were used, the OCCWG (2003) did not find significant differences between OCD and AC patients in overestimation of threat, intolerance of uncertainty and perfectionism, suggesting that these beliefs may be relevant for OCD but not specific to this disorder. Later on, the OCCWG (2005) found that OCD and AC subjects differed on two scales of the OBQ-44 (Responsibility/Threat estimation and Importance/Control of thoughts) but not on Perfectionism/Certainty. Nevertheless, the results of a recent study (Tolin et al., 2006) did not support the existence of OCD-specific beliefs. Indeed, when these authors applied the original six-factor structure (OBQ-87), they found that Importance of controlling one’s thoughts was the only belief domain that was able to distinguish between OCD and AC patients. Furthermore, when controlling for depression and trait anxiety, Tolin et al. (2006) observed that clinical OCD subjects did not differ from AC patients on any of the OBQ-44 scales. In a similar vein, other authors have found no differences between the
dysfunctional beliefs of OCD and pathological gambling patients (Anholt et al., 2004). A cluster analysis of the OBQ has shown that 55% of the OCD patients showed a OBQ-44 total score similar to that obtained by the anxious and non-clinical controls (Calamari et al., 2006; Taylor et al., 2006), and that 26% of the OCD sample showed low scores on all the OBQ scales (Calamari et al., 2006).

On the whole, our results revealed that none of the theoretically OCD-relevant belief domains distinguish between OCD and depressive patients. Although these results are congruent with those published using different versions of the OBQ, we must emphasize that our data are even more indicative of the non-specificity of belief domains. It is important to point out that, as far as we know, the present study is the first one to include a depressed clinical control group, and our results suggest that the beliefs hypothetically related to OCD are also endorsed by depressed patients. In our opinion, this fact justifies the appropriateness of systematically including depressed controls in OCD research, as has been postulated in other studies (Belloch, Morillo, & Garcia-Soriano, 2009; Morillo, Belloch, & Garcia-Soriano, 2007).

Summing up, the OCD-related belief domains are much less specifically associated with OCD than was previously expected, at least as measured with the OBSI-R or with the OBQ. As Julien, O’Connor, and Aardema (2007, pp. 375) stated, the results obtained with the OCD belief measures are problematic for the OCD appraisal model: “If OCD and other anxious controls do not differ in belief domains, then the model does not explain why OCD individuals develop OCD and not another anxious disorder, and vice versa”. It is also possible that, as we have already mentioned, not all the belief domains play the same role in all the OCD manifestations or subtypes, as several authors have pointed out (Calamari et al., 2006; Taylor et al., 2006) and as our current data supports. In this sense, different authors have found that some beliefs better predict some OCD symptoms than others (Coles & Horng, 2006; Julien, O’Conoor, Aardema, & Todorov, 2006; Myers et al., 2008), and these data suggest the necessity of taking into account the heterogeneity of OCD when studying the associated cognitive phenomena.

Another possibility must be also explored. Self-assessment instruments may not be the best way to evaluate the endorsement of beliefs of a non-conscious nature, as McFall and Wollersheim (1979) stated some time ago. However, in our opinion the problem could be of a different nature, at least in relation to the OCD-beliefs. In the clinical routine it is frequently observed that OCD patients report that their dysfunctional beliefs are only activated when experiencing some specific thoughts (i.e., their obsessional contents), but not when they experience other intrusions. And those specific obsessional thoughts are the ones that activate their dysfunctional beliefs. In other words, the dysfunctional beliefs, as assessed by the OBSI-R or the OBQ, might not constitute generalized bias, since they could be better conceptualized as dysfunctional appraisals or a misinterpretation highly restricted to the specific upsetting obsessional contents that bother/upset the subject in each case. If this assumption is correct, the best way to evaluate the presence of dysfunctional beliefs specific (and not only relevant) to OCD subjects is by using more idiosyncratic measures, that is, assessment instruments more specifically directed toward the clinical obsessions that patients experience.

Finally, our study has several limitations. First of all, as is also evident in the majority of the published studies using the OBQ, we do not take into consideration the heterogeneity of the OCD. Nevertheless, it is more than reasonable to assume that not all the belief domains are relevant, nor do they have the same importance for all the OCD subtypes and/or symptom manifestations. In the current study, an approach to this important issue has been made by examining the associations among symptom dimensions and belief domains. Nevertheless, the limited number of patients and the fact that symptom dimensions, rather than patient subtypes, are under examination does not guarantee an adequate generalization of the obtained results. A further limitation of our study could be the inclusion of OCD patients without comorbidity with depression, given that in clinical settings comorbidity between these two disorders is more than usual.

References


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